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TWO NEW SPECIES OF ORIENTAL ODONATA

By Lt.-Col. F. C. Fraser, I.M.S. Retd., F.R.E.S.

Among a large amount of material collected in Siam and Laos by Dr. A. Kerr, I find that I have overlooked two new species of Odonata. One of these had been provisionally labelled as *Allophaea ochracea* (Selys), which it greatly resembled, but on a closer examination, it was found to be a new species belonging to the nearly related genus *Dysphaea*. The other new species closely resembles *Rhinagrion mima* (Karsch), but the colours and markings of the abdomen, in particular, differ so widely that I have no hesitation in pronouncing the species as new.

Dysphaea gloriosa sp. n.

♂: Hind-wing 32–35 mm. Abdomen 38–40 mm.

Head black marked with bright ochreous as follows: the lateral lobes of labium, the whole of labrum save for a narrow bordering of black and a short tongue of the same colour nearly traversing its middle, a broad transverse band on frons which descends the genae laterally, and lastly a small spot on each side of the vertex close to the outer ocellus. Prothorax black, its middle lobe with a large, raised, oval, ochreous spot on each side which is nearly confluent above over dorsum with its fellow, its posterior lobe with a large irregular spot on each side. Thorax velvety black with the following bright citron yellow markings: a small oblique spot on each side bordering the alar sinus, a narrow and complete antehumeral stripe broadening slightly below and curving strongly outwards above, an equally narrow humeral stripe angulated strongly forwards at the junction of its middle and lower thirds, a fine posthumeral stripe incomplete below, a pair of oblique stripes on each of mesepimeron and metepimeron narrowly confluent above. Legs black, the middle and hind pair of femora with a small distal spot of yellow on the outer side; the hind femora with a yellow stripe also on the outer side not quite meeting the distal spot. Wings a rich golden amber tint, this tint becoming increasingly intensified towards the base of wings from a level slightly distal to nodus. Apices slightly enfumed up to level of pterostigma which latter is long, narrow and black, covering 8–9 cells; about 30 antenodals and 20 postnodals in fore-wings, and 18–25 antenodals and 18–20 postnodals in hind-wings; discoidal cells traversed twice, but occasionally only once; 3 cubital nervures in all wings. Abdomen black with lateral stripes on segments 2–7 which broaden basalward and taper to a point apically, the stripes gradually decreasing in length from segments 3–7 and quite vestigial on segments 6 and 7, a narrow mid-dorsal line on segment 2 slightly dilated at each end, pale basal annules on segments 3–6. Anal appendages black, nearly twice the length of segment 10, rather compressed and broadened at the middle third, tapering to an obtuse point, coarsely spined on the outer side and with apices curling strongly inwards to meet or overlap each other. Inferior appendages very short, apposed and inconspicuous.

♀: Hind-wing 30 mm. Abdomen 32 mm.

Differs from the male by its more robust build, shorter abdomen, uncoloured wings and more extensive yellow markings. There is a median spot on epistome, the transverse stripe on frons is broader and extends backwards along the margins of eyes as well as forwards bordering the genae, the spots on vertex are much larger and oval in shape. The lateral stripes on the abdomen form a continuous unbroken line and there is a very large rounded spot on each side of segment 8. On the dorsum of segment 2 the mid-dorsal stripe extends outwards at each end to become confluent with the lateral yellow and so encloses two trapezoidal black spots. The middle as well as the hind femora broadly yellow on the outer sides. Wings hyaline or very palely enfumed, the apices only slightly so; pterostigma dark

ochreous between thick black nervures; venation as in the male but only one nervure traversing the discoidal cell; 26 antenodals and 14–15 postnodals in fore-wing: 23 antenodals and 16 postnodals in hind-wing.

Habitat: Siam and Laos. Pak Tawan, Prachaup Prov., Siam, 2 ♂♂, 31.viii.31; Bori Khane, Laos, Siam, 1 ♂, 29.iv.32; Muang Ban, Laos, Siam, 1 ♀, 28.iv.32. Type ♂ and allotype ♀ in my own collection.

This new species is very closely related to *D. ethela* Fraser, from which, however, it differs markedly by its deep golden-tinted wings. Otherwise, its size, long narrow wings and body markings are almost identical. The females of the genera *Dysphaea*, *Euphaea*, *Allophaea* and *Indophaea* are so much alike that it is only with difficulty that they can be differentiated, so that one can afford to be dogmatic in stating that the ancestral type was closely similar to these females. Accepting this as an hypothesis, those species in which the males most closely resemble the females must be the more primitive.

Of all the genera mentioned above, *Dysphaea* shows the closest resemblance between the sexes, those of *D. ethela* being remarkably alike, and that species therefore probably the most archaic of the group. Evolution in the males is marked first of all by a tinting of the wings which deepens to a strong amber shade, then becomes more or less enfumed and finally opaque. The opaque areas in *Euphaea*, the most highly developed of the genera mentioned, gradually extend to engulf the whole wing area. These changes are paralleled in *Dysphaea*, *Euphaea* and *Allophaea*, but the intermediate forms have become extinct in the case of *Indophaea*, whilst in *Allophaea* the changes in the wing colouring have stopped short before the opaque stage. Along with a development of colour in the wings, is found also a broadening of the hind-wing in *Euphaea* and *Anisophaea* and, to a less extent, in *Allophaea*.

Rhinagrion viridata sp. n.

♂: Hind-wing 23 mm. Abdomen 30 mm.

Head, prothorax and thorax marked exactly like *R. mima* (Karsch) but those on the prothorax and thorax a beautiful grass-green instead of bright yellow. Legs similar to those of *R. mima*. Wings hyaline, only 11 postnodals in fore-wing and 10 in the hind (13–14 in the fore-wings and 12 in the hind of *R. mima*), petiolation ceasing at the level of Ac or a fraction distal to that nervure, pterostigma black, covering 2 cells. Abdomen: segment 1 bright grass-green, its base blackish-brown and its apical border on each side finely black, segment 2 broadly black on dorsum for its basal half, grass-green for its apical half, the black changing to brown and then warm ochreous laterally, segment 3 similar but the grass-green area separated from the apical border by a broad black annule, the sides of which are prolonged basalwards and its dorsal part medially so as to enclose the green as a large cordate spot, segment 4 similar but the cordate green spot much smaller and entirely bisected dorsally by the black, segment 5 similar to 4 but the dorsal spot ochreous and almost obscured by blackish, segment 6 similar to 5 but the spot enlarging again and bright ochreous, segments 7–10 bright ochreous separated by fine apical black annules, segments 9 and 10 black on the ventral borders, whilst 10 has a small rounded mid-dorsal black spot. Anal appendages not differing in shape or colouring from those of *R. mima*.

Habitat: Siam–Burma frontier, Tenasserim–Bachrup boundary, one ♂ (*Dr. A. Kerr*) 28.v.32. This beautiful species is very closely related to *R. mima*, differing from it by its smaller size, by the different colour of the prothorax and thorax and the different colour and character of the markings of abdomen. The wings have a lower nodal index and the petiolation stops short slightly distal to the level of Ac. Type in my own collection.

ON THE BRITISH LESTREMIINAE, WITH NOTES ON EXOTIC SPECIES.—5. (DIPTERA, CECIDOMYIIDAE)

By F. W. Edwards, M.A., Sc.D., F.R.E.S.

Cordylomyia Felt, 1911.

(*Prosaprionus* Kieffer, 1913).

In this genus I include several species which have wings and tarsi resembling those of *Campylomyza* sensu stricto, but (1) the characteristic cup-like sensoria of *Campylomyza* are lacking, being replaced in the female antenna of *Cordylomyia* by numerous sensory hairs or spines; and (2) the male hypopygium (though taking various forms) is never quite of the *Campylomyza* type, the ninth tergite being much better developed. Several of the species have the eyes divided as in *Campylomyza*, but in others the division is incomplete, the upper and lower portions of each eye being separated by a narrow "neck" consisting of an irregular single or double row of facets. Other characters vary much according to the species, of which several distinct groups may be recognised.

Felt's excellent photograph of the hypopygium of his *C. coprophila* (the genotype of *Cordylomyia*) shows that this species is closely related to *C. xylophila* sp. n. and *C. rudis* (Winn.). Kieffer's *Pr. cellularis* (genotype of *Prosaprionus*) seems also to be nearly related to *C. rudis* as the description notes the subcylindrical antennal segments (2 + 10), the length of *R*1 (five times *Rs*) and the broad costal cell; indeed the only remark in the description which suggests that *P. cellularis* may not be identical with *C. rudis* is the statement that the empodium reaches three-fourths of the length of the claws, instead of being of the same length.

C. rudis (Winn.) (fig. 11, a, i, o).

(*C. fuscinervis* (Winn.) ♂ *nec* ♀).

One of the largest species of the tribe; body blackish, legs and other appendages also dark brown to blackish (in mature specimens). Thoracic integument dull, dusted with dark grey, hair pale. Mesonotal hair chiefly present on sides and in two dorso-central stripes, very few small hairs between the main stripes in front. Eyes not divided, one or two facets wide at narrowest. First segment of palpi with dense patch of short sensory bristles. Claws very finely denticulate, the most obvious of the few denticles subapical, sometimes only this one visible. Wings broad at base; *Cu*2 straight, nearly but not quite reaching margin forming with *Cu*1 a very acute angle.

♂. Antenna long, necks mostly about equal in length to basal portions of segments, neck of penultimate segment not much shorter; only one complete crenulate whorl. Abdomen with all tergites well developed and broad, including eighth (ninth smaller). Hypopygium: Sternocoxite with fairly deep median emargination; style subcylindrical, fully twice as long as broad, rounded at tip; anal segment not obvious; genital rod with large membranous expansion at tip. Wings with costal cell only moderately broad and anal area not very large; length 2–3 mm.

♀. Antennal flagellum of 10 segments, each with a total length nearly twice its breadth (1·8), necks about as long as broad (but not usually obvious in the dry specimen), sensory hairs numerous (especially on one side) but all slender and of moderate length. Abdomen scarcely extensile, tergites 2–6 all well developed; two equal subglobular spermathecae about as large as the cerci and both strongly sclerotised. Wings with costal and anal cells larger than in ♂, but otherwise similar; length 2·6–4 mm.

Oxon. : series taken in University Museum (*Hamm*). Cambs. : Cambridge (*Jenkinson*). Hants. : New Forest (*Adams*). Herts. : Letchworth (*F. W. E.*). Morayshire : Logie, 1 ♂ (*Jenkinson*). All specimens except the one from Logie taken in winter (October to March).

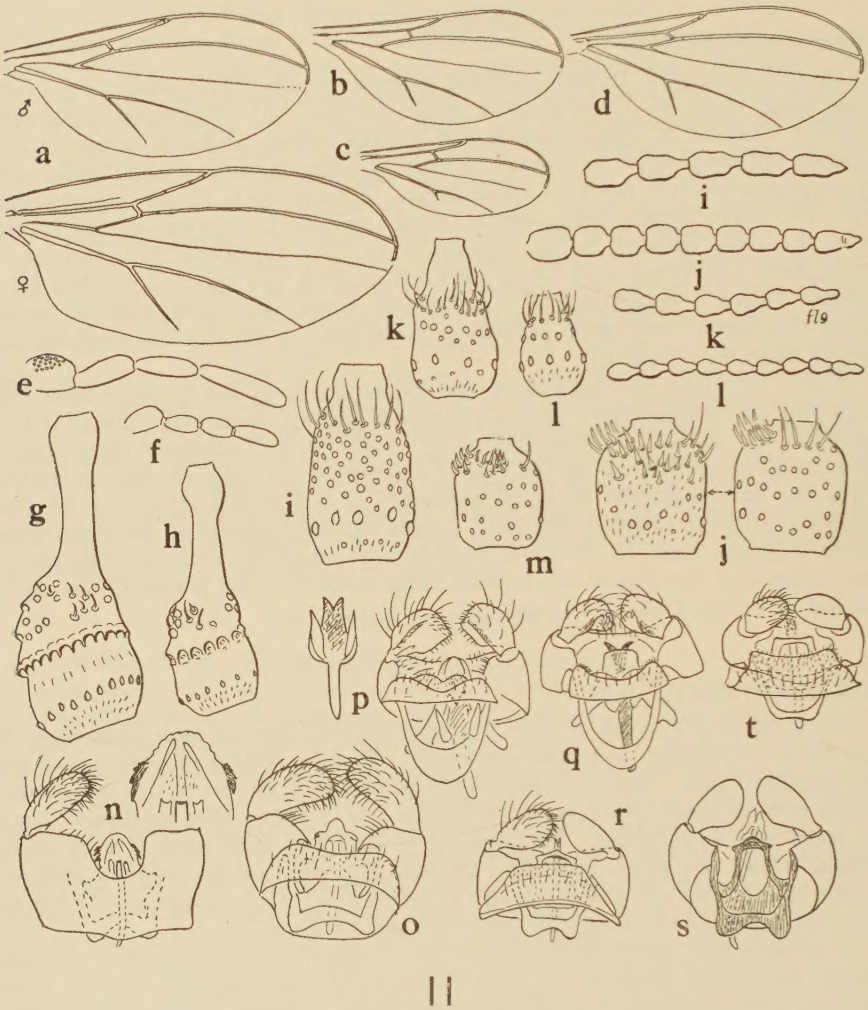

Fig. 11.—British *Cordylomyia*. a–d. Wing-venation. e, f. Palpi. g, h. Single flagellar segments of ♂. i–m. Tips of antennae of ♀, with single segments enlarged. n–t. Hypopygia of ♂. a, i, o, *rudis* (Winn.). e, j, n, *xylophila*. b, r, s, *hammi*. d, f, h, k, p, q, *bifida*. c, *bifida* var. ? t, *hammi* var. ?

C. xylophila sp. n. (fig. 11, e, j, n).

Very similar and obviously closely allied to *C. rudis* (Winn.), but rather smaller.

♂. The only discoverable difference from the ♂ of *C. rudis* is in the structure and shape of the aedeagus (compare fig. 11, n, o); the distinctions are very small and of doubtful value, but appear constant in the few specimens examined. Wing-length 2 mm.

♀. Differs obviously from the ♀ of *C. rudis* in the shorter antennae; flagellar segments not much longer than broad (under 1·3), with necks very short or absent; sensory hairs nearly all very short and spine-like, some of them grouped into a nearly circular patch on one side; terminal segment in two of the three specimens examined small and fused with the penultimate (so that the antennae have actually 2 + 9 segments), but in the third specimen the last two segments are subequal as in *C. rudis*. Wing-length 2–2·7 mm.

HERTS.: Sherrard's Wood, Welwyn, 30.ix.37, 3 ♂♂ 1 ♀ over burnt larch stump; Hitch Wood, x.36, 1 ♀; Knebworth, 6.v.23, 1 ♀.

C. bifida sp. n. (fig. 11, c, d, f, h, k, p, q).

A much smaller species than *C. rudis* (Winn.), differing in venation in having *R*1 relatively shorter (only about 3–4 times as long as *Rs*) and the cubital fork rather less acute, with *Cu*2 rather more abbreviated. Palpi with comparatively few sensory hairs on first segment, not forming a conspicuous patch. Eyes divided, structure practically as in *Campylomyza flavipes* Mg. Empodium fairly broad and about as long as claws. Pore 5 on *R*5 as in other species of this genus.

♂. Antennae much as in *C. rudis*, flagellar segments (including penultimate) with long necks and one complete crenulate whorl. Abdominal tergites 6–8 rather narrow. Hypopygium small; tergite rather narrow; sternocoxite with its posterior edge almost straight, scarcely emarginate in middle; style short, truncate, with a flange on dorsal surface; genital rod long, with large head and a blackened forked tip. Wing-length about 1·7 mm.

♀ (?). Antennae 2 + 9, flagellar segments somewhat flask-shaped, terminal one constricted beyond middle, distal part narrower; sensory hairs all of moderate length and slender, much as in *C. rudis*, but fewer. Abdomen rather greatly extensile; spermathecae absent (*i.e.* unsclerotised) in the single (possibly abnormal) specimen examined. Wings resembling those of ♂ in shape and venation; a peculiarity of this specimen is the presence of an extra pore on *R*5 below tip of *R*1. Wing-length just under 2 mm.

HERTS.: Knebworth Wood, 13.iii.38, 1 ♂ drowned in sap on stump of newly-felled birch; Letchworth, ix.36, 1 ♂ on window. YORKS.: Mulgrave Woods, Whitby, 16.iv.38, 1 ♀ on tree-trunk (*H. Britten, jr.*). The female is associated with the males owing to the similarity in eyes and wings, but only doubtfully.

Another female specimen, taken at Loch Callater, Aberdeen, vii.37 (*R. L. Coe*) resembles the one from Mulgrave in structure of antenna but is smaller (wing-length only 1·3 mm.) and *Cu*2 is reduced to a short stump (fig. 11, c); two equal and subspherical spermathecae are present, as in *C. rudis*. This specimen perhaps represents another species of the group.

C. hammi sp. n. (fig. 11, b, r, s, t).

Very much resembles *C. bifida* sp. n., notably in the divided eyes and abbreviated vein *Cu*2, but the empodium (though as long as the claws) is narrower, the cubital fork is rather more acute, and the hypopygium differs.

♂. Necks of flagellar segments even longer than basal portions (penultimate a little shorter); one complete crenulate whorl. Abdominal tergites 6–8 rather narrow. Hypopygium small; tergite rather large (including a less sclerotised distal portion); sternocoxite as in *C. bifida*; style short, broadest in middle, without flange; tegmen forming a heavily sclerotised arch; genital rod long, tip not blackened and not obviously bifid. Wing-length about 1·7 mm.

♀. Not obtained (unless the ♀ described under *C. bifida* belongs here).

Herts.: Letchworth, ix.37, 2 ♂♂ on window. Bucks.: Ivinghoe Common, 3.x.37, 1 ♂. Oxon.: University Museum, 24.x.19, 2 ♂♂ incl. type (*Hamm*).

One of the two males from Letchworth differs slightly in hypopygium from the other four specimens, the style not being so broad (fig. 11, t).

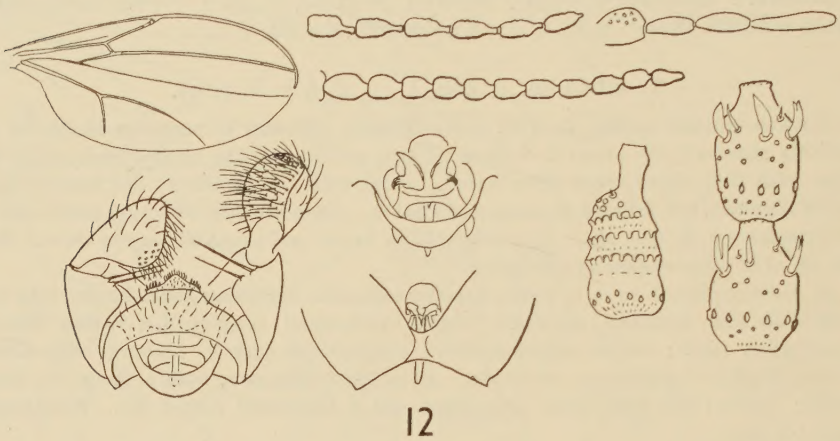

Fig. 12.—*Cordylomyia pinetorum* sp. n. Wing of ♀; tip of antenna of ♂ and whole flagellum of ♀ in outline; palpus; hypopygium; enlarged flagellar segments of ♂ and ♀.

C. pinetorum sp. n. (fig. 12).

This species differs considerably from all those described above in antennae and genitalia, and in other respects as described below. Eyes divided as in *Campylomyza*. Palpi without obvious sensory patch on first segment. Mesonotum with rather numerous small pale hairs spread over most of the surface. Empodium rather broad. Wings with cubital fork wide, *Cu*2 slightly curved and slightly abbreviated.

♂. Antennae with necks barely half as long as basal part of segments; two complete crenulate whorls, and a third passing more than half-way round. Abdominal tergites 5–8 very narrow. Hypopygium: tergite broadest in middle; anal segment better developed than in the other species, with numerous short stiff bristly hairs; coxites divided almost to the base beneath; style very broad, hairy on inner surface; genital rod much as in *Campylomyza*. Wing-length about 1·7 mm.

♀. Antennae 2 + 11; flagellar segments approximately oval, provided subapically with a whorl of about six stout sensory blades, some of them bifid at the tip, and a few shorter and more slender hairs. Abdomen with tergites 2–6 rather large and undivided, 7–9 forming a more or less extensile ovipositor. A single rather large disc-like spermatheca present, as in *Campylomyza*. Fourth tarsal segment of front legs about twice as long as broad, fifth slightly longer and thicker than fourth. Wing-length about 2·3 mm.

Devon: Sidbury, v.36, very abundant in pine-wood, 15 ♂♂ 23 ♀♀ preserved. Herts.: Hitch Wood and Sherrard's Wood, x.36, among larches. Bucks.: Ivinghoe Common, v.38, 1 ♂. N. Lancs.: Low Wood, v.38, under yew tree, 4 ♂♂ 1 ♀; Manchester, x.29, 1 ♀ (*H. Britten*). Scotland: Cromarty, viii.09, 1 ♀ (*King*).

Corinthomyia Felt.

The main feature upon which Felt founded this genus was the structure of the male antenna, the flagellar segments being provided with numerous similar whorls of short hairs instead of the usual three or four dissimilar whorls of longer hairs. The genus has hitherto been recorded only from North America, and the female sex has not been recognised. I have, however, examined one male from Austria of a species which is very close to, if not identical with, *C. cincinna* Felt, and several females from Britain which probably belong to the same species. From a study of these specimens it is clear that in most of its characters (other than the structure of the male antenna) *Corinthomyia* resembles *Cordylomyia* Felt; the female of the species examined differs from typical *Cordylomyia* principally in the wider cubital fork and the condition of the spermathecae.

It is not improbable that some of the American species described by Felt from the female only as *Cordylomyia* belong to *Corinthomyia*.

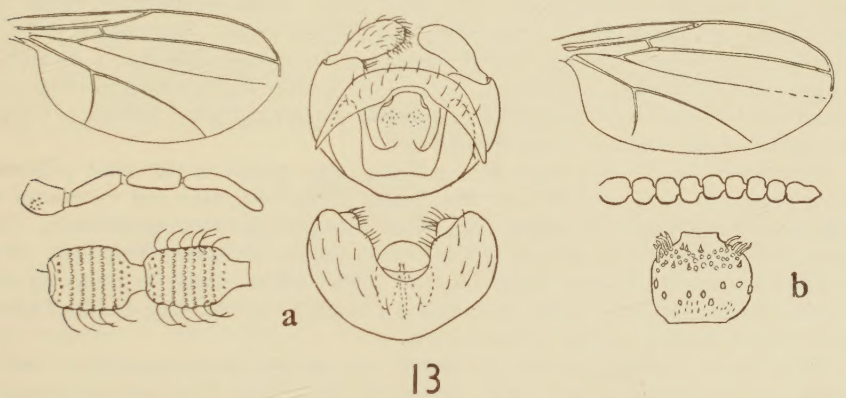

Fig. 13.—*Corinthomyia cincinna* Felt ? a. ♂ from Vienna, wing, palpus, antennal segments (anterior view, diagrammatic), hypopygium. b. ♀ from Letchworth, wing, outline of flagellum with one segment enlarged.

C. cincinna Felt (?) (fig. 13).

Dark species; thorax blackish, legs and halteres dark. Mesonotal integument not or very slightly shining, rather uniformly but not densely clothed with short pale hair. Eyes 2–3 facets wide at narrowest point. Palpi with sensory patch on first segment inconspicuous. Tarsi with hairs only. Claws very finely denticulate, empodium broad. Wings as figured.

♂. Flagellar segments with four complete crenulate whorls, and two or three more passing about half-way round the segment (these evidently included by Felt in the total of seven whorls noted as present in his species). Hypopygium as figured; structure in general very similar to that of *C. rudis* (Winn.). Wing-length 1·8 mm.

♀ (?). Antennae 2 + 9, flagellar segments except first and last somewhat broader than long, with a subapical band of very numerous short sensory spines and some a little longer; terminal segment longer, constricted slightly near middle. Abdomen with tergites 2–6 large and undivided. Spermathecae two in number, one very small and strongly sclerotised, the other large but weakly sclerotised. Last two segments of front tarsi subequal. Wing-length about 2 mm.

Austria : Vienna, 1 ♂ (*Mik*; determined as *C. atra* Mg.).

England : Letchworth, Herts., 5 ♀♀, taken on windows viii.1919, viii.1935, ix.1936 and viii.1937.

The females from Letchworth are provisionally determined as *C. cincinna* on account of the rather close resemblance in the wings, the cubital fork being much wider than in most species of *Cordylomyia*. A very similar (badly damaged) female is in Meigen's collection in Paris labelled *C. atra*.

Xylopriona Kieff. and *Tetraxyphus* Kieff. (figs. 14, 15).

These two genera of Kieffer's were founded principally on the structure of the female antenna; in most other respects they are alike, and there appears to be no clear distinction between them in the male sex; moreover, intermediate types of female antenna occur, so that the two genera might well be united.* The following characters are common to both :—

Eyes two or three facets wide at narrowest point. Front with rather deep median furrow, on each side of which are a few short hairs. Palpi 4-segmented, rather long, first segment not much thicker than second; no distinct scales. Antennae of ♂ 2 + 12, flagellar segments very eccentric, shaped much as in *Cordylomyia* Felt (fig. 11, g), with one complete crenulate whorl. Antennae of ♀ 2 + 12 to 2 + 22, varying according to the species and to some extent individually; sensoria various but never forming a complete cup and never only two in number, usually four.

Mesonotum black, surface more shining than in other genera of the tribe; pubescence rather uniformly distributed but not very dense. Tarsi with hairs and sometimes with narrow scales mixed with the hairs. Empodium as long as claws and quite broad. Claws finely denticulate or striate on outer surface about middle, not enlarged near tip. Wings with dense macrotrichia, present also on *R*5. Costa reaching nearly as far as tip of *M*. *R*1 of moderate length, 2–3 times as long as *rm*, which is very oblique; *Cu* faint towards tip, not quite reaching margin. Pore 5 on *rm*.

Hypopygium : tergite narrow, but usually less so than in *Campylomyza*; cerci not usually distinguishable; sternocoxite with moderately large V-shaped indentation of posterior margin; style rather small, infolded, with a terminal spine; tegmen shield-shaped; genital rod as long as tegmen, its tip not enlarged. Spermathecae : two in number, small, round, thick-walled.

The two groups of species included here are distinguished as follows in the female sex :—

Xylopriona (fig. 14) : Flagellar segments broader than long (excluding the neck), sensoria in the form of broad plates, normally four in number but in some cases two of them are fused into one plate occupying half the circumference of the segment; plates each arising from a row of pores which may be all small or one may be much larger than the rest. Abdomen with tergites 2–4 reduced or faint; segments 5–8 forming a long protrusible ovipositor. Last segment of front tarsus without specially dense pubescence beneath, but with a few longish hairs overhanging claws.

Tetraxyphus (fig. 15) : Flagellar segments with the basal part (excluding neck) at least as long as broad, sensoria in the form of pointed blades, rarely bifid at tip, varying in length with the length of the neck, and always four in number; each blade usually arising from a single large pore though occasionally one or two smaller pores are also

* It is not unlikely that both *Xylopriona* and *Tetraxyphus* will have to be sunk under *Monardia* Kieff., but as I have not yet been able to examine the genotype of *Monardia* I leave them separate for the present.

present. Abdomen with tergites 2–5 all well developed, broadly rectangular; ovipositor not greatly protrusible. Last segment of front tarsus more or less enlarged, and provided with dense short hair beneath forming a sole.

In the male sex I have been unable to discover any clear distinction between the two groups, but sensoria more or less similar in type to those of the females (though smaller and in a more rudimentary condition) may usually be detected on the first three or four flagellar segments.

Kieffer included three species in *Xylopriona*, but two of these (*kollari* (Winn.) and *antennata* (Winn.)) were evidently known to him from descriptions only; they have rudimentary empodia and do not properly belong here.

X. pulchricornis Kieff.

Kieffer described the flagellar segments of the type ♀ (20 in number) as having three sensoria, one very broad and apparently occupying about half the circumference, the other two nearly semicircular and each united with a filiform appendage on the side adjacent to the larger sensorium. None of the specimens I have examined could be described as having "filiform appendages" to any of the sensoria and I therefore feel bound to regard the British forms so far obtained as distinct from *X. pulchricornis*, though they are evidently very similar. Kieffer, moreover, describes the ovipositor (including the cerci) as clear yellow, which is not the case in British specimens.

X. querceti sp. n. (fig. 14).

♀. Membranous parts of body yellow, hence abdomen in life appears largely yellow owing to reduction of tergites; legs and halteres blackish, but tarsi somewhat lighter; cerci dark, not clear yellow; ovipositor appearing largely blackish in life. Mesonotal hair blackish. Antennal flagellum with 16–17 segments, necks very short (fig. 14, b, j, k). Last segment of front tarsi scarcely half as long again as penultimate (fig. 14, h). Abdomen with first tergite forming a very narrow transverse strip; second broader but still transverse and quite small; third larger than second, squarish; fourth segment large but without well-defined tergite. Wing 2·2–2·5 mm.

♂. Differs from ♀ in having mesonotal hair yellow. Necks of flagellar segments (including that of the penultimate one) about as long as the basal portion (fig. 14, d, a segment near base of antenna to show sensoria). Hypopygium (fig. 14, g): tergite reduced to a very narrow strip bearing a single row of hairs, much as in *Campylomyza*; roots of coxites arising very close to insertion of style.

Beds.: Whipsnade, 8.iv.38, 2 ♂♂ 2 ♀♀ (incl. type ♀); Milton Bryan, 12.iv.38, 1 ♂ 2 ♀♀. Herts.: Breachwood Green, 3.v.36, 1 ♀. Mostly at edges of oak-woods. Also 1 ♀ in old British collection without data, determined by Walker as *C. atra* Mg.

Although no specimens were taken paired it is almost certain that the males described belong with the females.

X. querceti var. vel sp. n.?

♀. Colouring and abdominal tergites much as in *X. querceti* sp. n. Antennal flagellum with 20 segments, necks much longer than in *X. querceti*, sensoria wide but not deep (fig. 14, l). Last segment of front tarsi about twice as long as fourth (fig. 14, i). Wing 2·8 mm.

♂ ? Hypopygium (fig. 14, e) with tergite much less reduced than in *X. querceti*, with roots of coxites arising further from base of style.

Hants.: Farley Down, 20.v.36, 1 ♀ 1 ♂ taken over old beech stump at edge of wood.

As only these two specimens (both freshly emerged) were taken over this stump I have assumed they belong to the same species, but it is possible that the ♂ is that of a *Tetraxyphus* (its hypopygium is almost exactly like that of *T. ater* (Mg.)); if so the ♀ may be merely a variant of *X. querceti*.

Two females from near Crickhowell (Brecon) and one from Hitch Wood (Herts.) may represent either variations of *X. querceti* or possibly another species. They have 19–20 segments in the flagellum, necks not quite so long as in the Farley ♀, sensoria deeper (fig. 14, m, n), fifth front tarsal segment shorter, as in *X. querceti*. The Crickhowell specimens were taken on hazel stumps in a shady lane, four similar-looking males being taken at the same time; in three of these males the hypopygium (fig. 14, f) closely resembles, without being quite identical with, that of the Farley Down ♂ or *T. ater* (Mg.); the fourth exactly agrees with *X. querceti*.

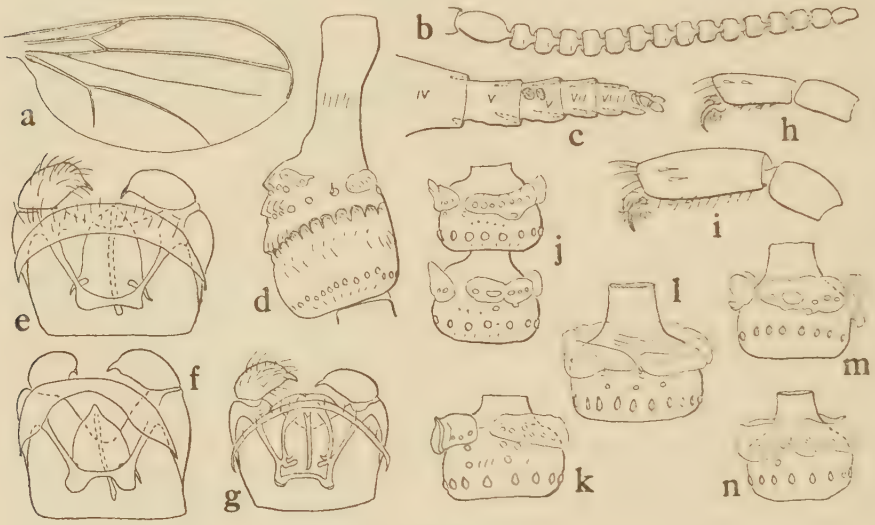

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Fig. 14.—British *Xylopriona*. a. Wing-venation. b. Outline of flagellum of ♀. c. Ovipositor, only partially extended, showing spermathecae. d. Enlarged flagellar segment of ♂. e–g. Hypopygia. h, i. Last two segments of front tarsi of ♀. j–n. Flagellar segments of ♀. a–d, g, h, j, k, *querceti*. e, i, l, *querceti* var.? (Farley). f, n, *querceti* var.? (Crickhowell). m, *querceti* var.? (Hitch Wood). [N.B.—e and f are perhaps *Tetraxyphus* ♂♂ and not *Xylopriona*.]

T. ater (Mg.) (fig. 15).

(*C. atra* Mg.; *C. halterata* Zett.?; *C. valida* Winn.; *T. melanopterus* Kieff.?).

I propose to fix Meigen's name to a form characterised as below. Meigen's type ♂ is fragmentary, but there is nothing to show that it was *not* this species, and the same may be said of Zetterstedt's *C. halterata*. Winnertz's types of *C. valida* agree, and as the species is evidently a common one I suspect that Kieffer's *T. melanopterus* is also the same: Kieffer describes the eyes as "non confluents au vertex dans les deux sexes" and later as "distants au

vertex (♂♀)," but as I have seen no Campylomyzine in which the eyes are separated by more than a very narrow line on the vertex I imagine this may have been an error.

♀. Membranous parts of body dull reddish; but as the abdominal tergites are well developed the general effect is blackish. Legs usually blackish, but sometimes paler, especially the tarsi. Halteres blackish. Mesonotal hair blackish. Antennal flagellum with 14–16 segments, which are flask-shaped, with the basal part about as long as broad and neck of moderate length; the four sensoria lanceolate. Fourth segment of front tarsi about half as long again as broad, fifth usually about 2·5 times as long as fourth, but sometimes as little as twice or as much as three times. Wing 3–4 mm.

♂. Rather smaller than ♀ and as in the case of *Xylopriona* differing in having yellow mesonotal hair. Antenna with long necks as in *Xylopriona*. Hypopygium as in fig. 15, c; tergite not very narrow and roots of coxites arising at some distance from base of style.

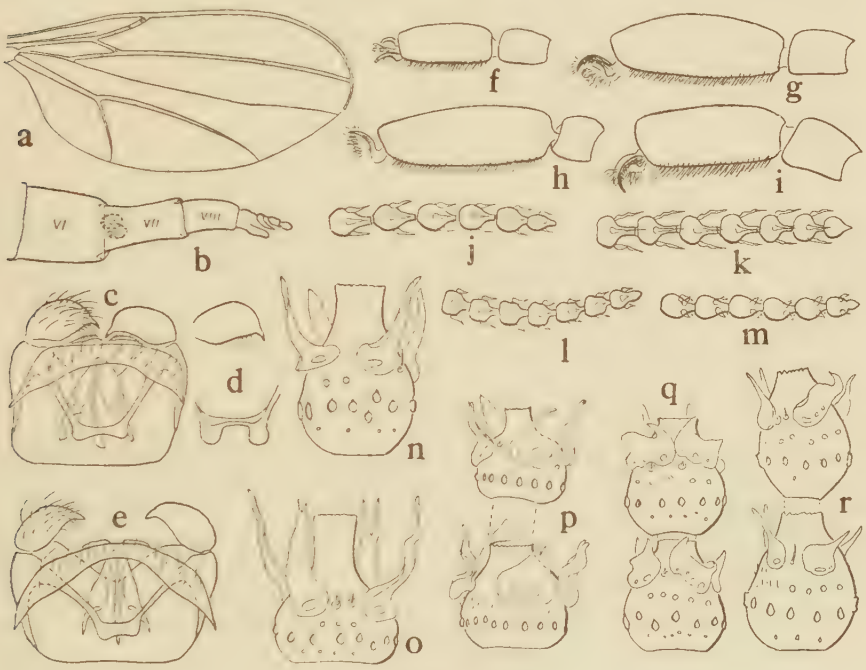

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Fig. 15.—British *Tetraxyphus*. a. Wing-venation. b. Ovipositor, fully extended. c–e. Hypopygia. f–i. Last two segments of front tarsi of ♂. j–r. Tips of ♀ antennae with separate segments enlarged. a–c, i, j, n, *ater*. f, g, *ater* var. d, h, l, p, *ater* var.? B. e, k, o. *ater* var.? A. q, r, *ater* var.? C.

Numerous specimens examined from various localities in Herts., Beds., Bucks., Oxon., Hants., Devon, Brecon, Argyll, Banff.

The species seems to be subject to a good deal of local and individual variation both in size and in the form of the flagellar segments and front tarsi of the female. The three forms described below are provisionally treated as extreme variants of *T. ater*, but one or more of them may well be distinct species. The group evidently requires intensive study.

T. ater var. ? A.

♀. Flagellum with 20–22 segments, necks markedly longer than in typical *T. ater*, and sensoria also more elongate (fig. 15, k, o). Fifth front tarsal segment four times as long as fourth, which is not much longer than broad.

♂. Hypopygium (fig. 15, e) with bar connecting roots of coxites rather shorter than in typical form; style also slightly different in shape. Last segment of antenna with a small knob or projection at tip (absent in typical *T. ater*).

Herts.: Hitch Wood, 26.ix.37, 2 ♀♀ 1 ♂ all taken in same spot.

T. ater var. ? B.

♀. Flagellum with 13 segments (Dingwall series) or 16–17 segments (Harpenden series), in either case the segments shorter than in typical *T. ater*, with very short necks and short, almost triangular sensoria (fig. 15, l, p). Fourth front tarsal segment only about as long as broad, fifth four times as long as fourth (fig. 15, h).

♂. Hypopygium (fig. 15, d): bar connecting roots of coxites strongly lobed at each end; style and other parts practically as in typical *ater*.

Herts.: Harpenden, 7 ♀♀ in light trap (*C. B. Williams*). Cromarty: Dingwall, series of ♀, 1 ♂ (*J. J. F. X. King*).

T. ater var. ? C.

♀. Differs from the other forms in having yellow mesonotal pubescence. Flagellum with only 12 segments, which are almost oval, without very definite neck, last with nipple-like tip; sensoria short, rather broad, some of them tending to be bilobed, the broadest ones arising from several pores (fig. 15, m, q, r). Fifth segment of front tarsi rather less than twice as long as fourth.

Gloucester: Symond's Yat, ix.36, 1 ♀. Oxon.: Oxford Museum, 9.v.23, 1 ♀ (*Hamm*).

Bryomyia Kieff.

Our knowledge of this genus rests hitherto solely on Kieffer's description of the genotype, *B. bergrothi*. In this description Kieffer emphasised chiefly the form of the claws and the long, narrow empodium, features which as it now appears are of minor significance; but he also noted other details, such as the form of the female antenna and the bilobed ninth tergite of the male, which are diagnostic. Kieffer described the flagellar segments of the female as having four sensoria, but his figure in *Genera Insectorum* appears to show only two, which as it now appears must be correct.

From a study of four or more British species I re-define the genus as follows:—

Eyes two or three facets wide at narrowest point. Front indistinctly bilobed. Palpi 4-segmented, first not enlarged, fairly numerous small scales present. Antennae of ♂ 2+12, flagellar segments shaped as in *Cordylomyia* Felt (fig. 11, g), mostly with one complete and oblique crenulate whorl, but last few segments with two complete and less oblique whorls. Antennae of ♀ 2 + 8, flagellar segments each with *two* sensoria (one on each side) each arising from a single large pore; first segment not longer than second, terminal segment long and constricted in middle.

Mesonotum with longish hairs at sides and in biserial dorsocentral rows, intervening areas almost or quite devoid of hairs (a distinction from most other genera of the group). All tarsal segments with numerous small scales, some similar scales also towards tips of tibiae. Empodium either almost as long as claws (but quite narrow) or rudimentary. Claws smooth but somewhat enlarged before the tip. Last two segments of front tarsi of

♀ subequal. Wings with dense macrotrichia covering the membrane, but in spite of this with few or no macrotrichia on *R*5. Costa produced about two-thirds of the way from *R*5 to *M*; *R*1 twice to three times as long as *rm*, which is not very oblique; *M* somewhat bent downwards near tip, thence running to margin parallel with *R*5; *Cu*2 reaching margin; pore 5 on *rm*.

Hypopygium: tergite variously shaped but always well developed and bilobed; cerci distinct though sometimes hidden under tergite; style large, not infolded, without terminal spine; genital rod small but developed at tip into a pair of strips or loops supporting a bladder-like structure. Spermathecae: two in number, both large, round, thin-walled, resembling the single large spermatheca of *Campylomyza* s.str.

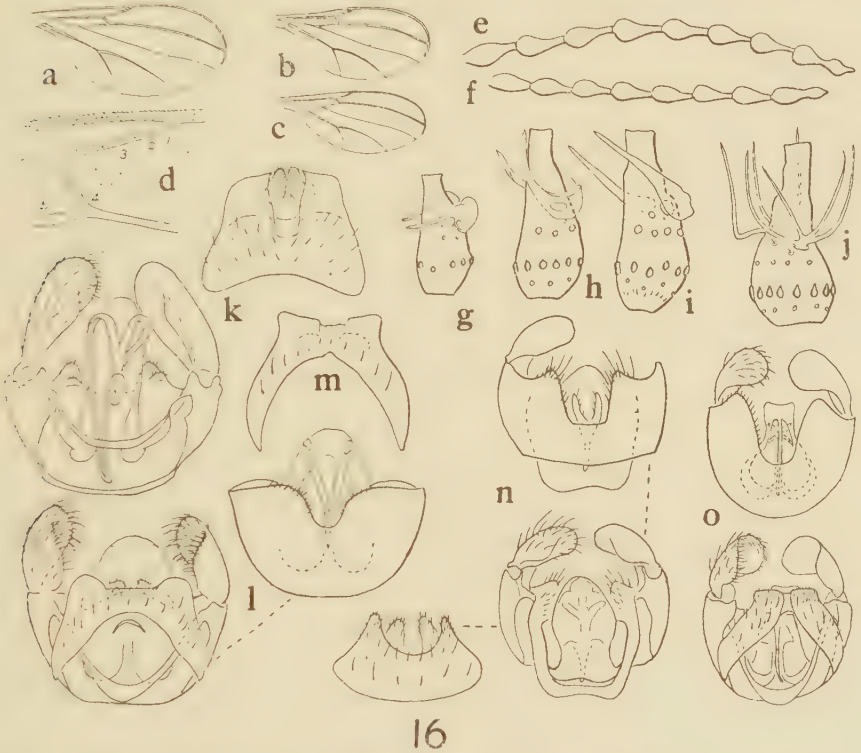

Fig. 16.—British *Bryomyia*. a–c. Wing-venation (⅔ scale of other wings shown). d. Enlarged portion of wing to show pores. e, f. Outline of flagellum of ♀. g–j. Single flagellar segments of ♀. k–o. Hypopygia of ♂, tergite in some cases removed and drawn separately (l, m, n to rather larger scale than k and o). a, e, j, k. *trifida*. b–d, f, h, o. *apsectra*. g, l. *bergrothi*. m. *bergrothi* var. i. *apsectra* var.? n. *cambrica*.

B. trifida sp. n. (fig. 16, a, e, j, k).

Mesonotum blackish-brown, not shining, appearing somewhat grey-dusted towards sides when seen from in front; hair pale. Pleura extensively pale, but sternopleura blackish. Legs pale. Empodium narrow, rather more than half as long as claws. Antennae of ♂ with necks from ½ to ¾ as long as segments, necks of basal and penultimate segments shorter than those of middle segments. Antennal sensoria of ♀ split to the base into three (occasionally four) slender spreading processes. Hypopygium of ♂ large for the size of the insect; tergite almost rectangular, ending in two truncate bare lobes; coxites fused except for two triangular hairy terminal lobes. Wing with *R*1 about three times as long as *rm*; cubital fork rather acute, *Cu*2 straight. Wing-length 1·7–2·1 mm.

Herts.: Breachwood Green, 3.v.36, 2 ♂♂; Fisher's Green, 4.v.38, 1 ♂; Letchworth, viii.37, 1 ♀. Beds.: Milton Bryan, 12.iv.38, 1 ♂. Bucks.: Ivinghoe, 7.iv.38, 3 ♂♂, 15.v.38, 1 ♀. Hants.: New Forest, 17.x.37, 1 ♂. Sussex: Crowborough, 11.iv.21, 1 ♀ (*Jenkinson*). Devon: Weston Cliff, Sidmouth, v.36, 1 ♂ (abnormal antennae with only 2 + 9 segments); Clovelly, v.36, 3 ♂♂ including type. Morayshire: 5.ix.09, 19–24.ix.10, 3 ♂♂ (*Jenkinson*). Yorks.: Mulgrave Woods, Whitby, 16.iv.38, 1 ♂ (*H. Britten, jr.*).

B. bergrothi Kieff. (fig. 16, g, l, m).

Smaller than *B. trifida* and not quite so dark. Empodium narrow and about two-thirds as long as claws. Antennae of ♂ much as in *B. trifida*. Antennal sensoria of ♀ with basal half broad, almost semicircular, distal half narrow, directed transversely. Hypopygium of ♂ relatively smaller than in *B. trifida*; tergite in the form of a rather narrow arch, with two small but broad bare lobes; coxites very extensively fused beneath. Wing with *R*1 about twice as long as *rm* (slightly less or more); cubital fork rather less acute than in *B. trifida*, *Cu*2 slightly curved. Wing-length 1·4–1·7 mm.

Oxon.: Ditchley, v.37, 1 ♂. Devon: Clovelly, v.36, 1 ♂. Yorks.: Ravenscar, station window, viii.37, 1 ♂ 1 ♀.

This species agrees fairly well with Kieffer's description and figures except as regards the number of female antennal sensoria, as already noted; the figure of these organs given in *Genera Insectorum* (1913) might represent the same structure as found in the Yorkshire female here figured in a different position, the narrow tip being hidden or foreshortened.

The form of the ninth tergite varies somewhat in the three males examined.

B. apsectra sp. n. (fig. 16, b, c, d, f, h, o).

Very similar to *B. bergrothi* Kieff. as determined above, but differs notably in having the empodium rudimentary. Antennal sensoria of ♀ with basal part rather less broad and distal part rather less slender than in *B. bergrothi*, usually curved with the points directed distally, but apparently variable in this respect. Hypopygium (fig. 16, o) very similar to that of *B. bergrothi*, but differing in several details as illustrated; tergite almost completely divided in middle, lobes finely pubescent. *R*1 longer than in *B. bergrothi*, 2·5–3 times as long as *rm*, but cubital fork somewhat wider than in *B. trifida*. Wing-length 1·4–1·7 mm.

Herts.: Hitch Wood, ix.–x.36, swept by shady mossy bank, 14 ♂♂ 7 ♀♀, including types; Sherrard's Wood, 22.x.36 and 23.ix.37, 4 ♂♂ 4 ♀♀; Letchworth, 10.v.17, 1 ♀ on window. Bucks.: Ivinghoe, 3.x.37, 6 ♂♂ 8 ♀♀. Hants.: New Forest, 17.x.37, 2 ♂♂. Somerset: Quantock Hills, vi.38, 2 ♂♂. Devon: Sidbury, v.36, 3 ♀♀; Clovelly, v.36, 1 ♀.

A ♀ from Chedworth, Glos., is structurally similar but had the body entirely yellow in life. A male from Letchworth and another from Logie have the hypopygium as in the type but empodia about half as long as claws; a female taken at the same time as this Letchworth male has straight instead of curved sensoria; the wing of the Logie ♂ is markedly narrower than in the type. These variations are perhaps merely individual.

B. cambrica sp. n. (fig. 16, n).

Very similar to *B. bergrothi* as determined above, differing only in the hypopygium (fig. 16, n). Ninth tergite quite different in shape from that of the other three species, broad, with a pair of pointed pubescent processes; sternocoxite more deeply divided than in *B. bergrothi*. Wing-length 1·3 mm.

Brecon: Llangattock, x.37, 1 ♂.

ON A COLLECTION OF LYMANTRIIDAE (HETEROCERA) FROM CHINA

By C. L. Collenette, F.R.E.S.

With Plate 1.

This paper deals with a collection of nearly three thousand Lymantriidae from China, made by Dr. H. Höne of Shanghai, and forwarded to me by Dr. Martin Hering of the Zoological Museum, Berlin. I am very much indebted to these two gentlemen for their kindness in allowing me to work on these insects.

Three previous collections from the same source have already been dealt with.* The present consignment includes insects from six different Provinces, and not only contains a number of interesting new species, but also numerous examples of known species from hitherto unrecorded districts, providing important information on distribution. I have therefore included in the latter half of the paper a list of the species not discussed in the first part, showing in each case the Provinces in which they were taken.

The localities represented in the collection are as follow :—

North Yunnan : Li-kiang, 8500, 10,000 and 12,000 feet.
Hunan : Hoeng-shan, 900 metres.
Chekiang : West Tien-mu-shan, 1600 metres; and East Tien-mu-shan, Lingan, 1500 metres.
South Shensi : Tapaishan, Tsinling, 1700 and 3000 metres; and Sianfu, Tsinling.
Shantung : Tai-shan, 1550 metres.
Kiangsu : Lungtan Mountains, Nanking; and Shanghai.

The types have been returned to Berlin, while paratypes and duplicate specimens, where available, have kindly been presented to the British Museum (Natural History).

Arctornis l-nigrum Müller, 1764 (pl. 1, fig. 14).

2 ♀♀, Chekiang. Another ♀ from North Yunnan, expanse 53 mm., has a dark antennal shaft and the upper branch of the L mark on the fore-wing obsolete. This insect may represent a local race, but I refrain from naming it until additional material is available.

Arctornis hemilabda sp. n.

♂. Palpus white. Antennal shaft white, pectinations pinkish buff. Head, body and legs white; a line of sepia on the head, joining the bases of the antennae; a spot of sepia proximally on the inner side of the fore-tibia, and on the fore and middle tarsus a spot proximally and another distally on the outer side. Wings above and beneath white; a short streak of sepia on the upperside of the fore-wing, running from the centre of the discocellulars almost to the origin of vein M2; a narrow line of sepia along the termen on the underside of the fore-wing; fringes white, tipped sparsely with sepia.

♀. Resembles the ♂, but with the pectinations of the antennae pale pinkish buff.

Expanse : 44–48 mm., ♀♀ 48–49 mm.

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* 1934, *Stylops* **3** : 113–117; 1936, *Ann. Mag. nat. Hist.* (10) **17** : 329–346; 1936, *Ent. mon. Mag.* **72** : 90–91.

1 ♂ (holotype), 1 ♀ (allotype), and 1 ♂, 1 ♀ (paratypes), June–September 1933, 900 metres, Hoeng-shan, Hunan.

May be separated from *Arctornis l-nigrum* Müller by the absence of dark marking on the palpus, the presence of a line of sepia on the head between the antennae, and the restriction of the L mark on the discocellulars to a short streak.

Redoa Walker.

The British Museum collection contains a large number of insects of this genus from the Indo-Australian region which have not been determined, and which are difficult or impossible to separate into species on external characters. Mr. W. H. T. Tams has kindly made photographs and drawings of the genitalia of nearly 70 males from different localities, which show striking differences, and evidence that many species are involved. With the photographs as a guide, it is usually possible to classify the males by examination with a hand-lens after removing the anal hairs, and without detaching the abdomen. Females are more difficult to separate, and must be distinguished largely by locality.

Species contained in the Höne collection are described below. It is hoped in a subsequent paper to describe and figure other species from the Indo-Australian region, and by this means to clear up a difficult problem.

Redoa anser sp. n. (pl. 1, fig. 16).

This species is indistinguishable in general appearance from *Redoa cygna* Moore (N.E. Bengal), and its supposed synonyms *R. nigricilia* Swinhoe (Khasis) and *R. cymbicornis* Butler (Darjiling). The types of these three are in the British Museum, but unfortunately *R. cygna* and *R. nigricilia* are females and *R. cymbicornis* a male lacking the abdomen. In the circumstances it seems best to restrict the name *Redoa cygna* for the present to insects from N.E. India.

The right clasper and harpe of *R. anser* are illustrated. The harpe broadens towards the tip into a club, slightly dentate on the outer side, and ending in a sharp point, which can be either upturned or straight. The insect is entirely white, excepting for dark brown markings on the head and palpus, spots on the legs and a single spot on the discocellulars of the fore-wing.

Expanse : ♂♂ 44–50 mm.

1 ♂ (holotype) and 11 ♂♂ (paratypes), May and June 1932, 1600 metres, West Tien-mu-shan, Chekiang; 11 ♂♂, Tapaishan, Tsinling, South Shensi.

Redoa anserella sp. n. (pl. 1, fig. 20).

♂. Strongly resembles *Redoa submarginata* Walker (Silhet). The type of *R. submarginata* has unfortunately no abdomen, but specimens from the same locality have a semicircular harpe which runs round the end of the clasper, in a plane at right-angles to the length of the clasper. In the present species the harpe is of equal thickness throughout its length, and runs almost straight along the upper edge of the clasper to its end, but is sometimes bent upwards at the tip. The right harpe and clasper are illustrated.

♀. Resembles the ♂ in external characters.

Expanse : ♂♂ 29–36 mm., ♀♀ 35–43 mm.

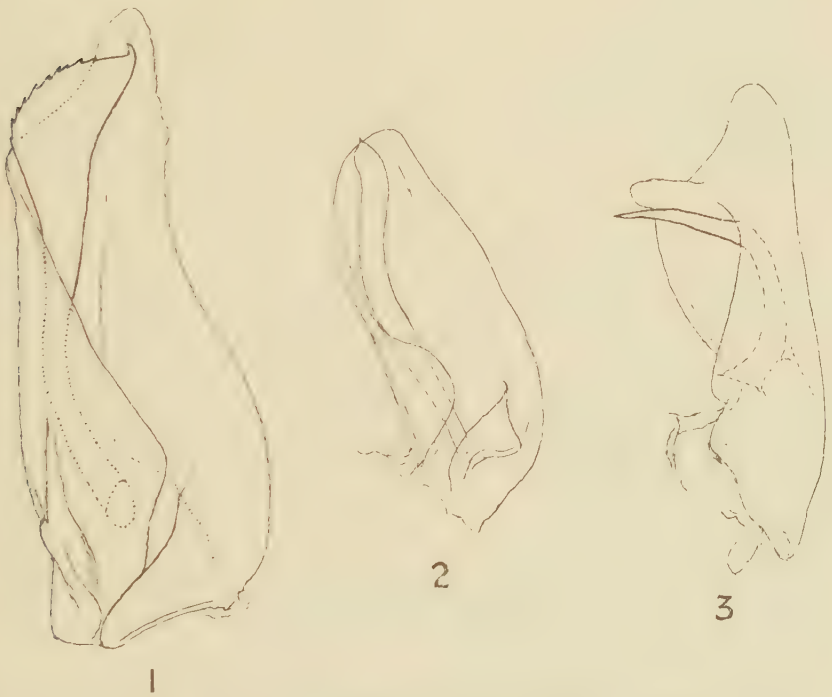
1 ♂ (holotype), 1 ♀ (allotype), 12 ♂♂, 14 ♀♀ (paratypes), 900 metres, April–September 1933, Hoeng-shan, Hunan; also 2 ♂♂, 2 ♀♀, 1600 metres, April–June 1932, West Tien-mu-shan, Chekiang.

Redoa phaeocraspeda sp. n. (pl. 1, fig. 7).

♂. Palpus tawny, on the inner side whitish. Antenna drab. Head tawny to russet, the lower part of the frons whitish. Body and legs whitish, fore and middle legs with a patch of fuscous to Mars brown proximally on the inner side of the tibia, and a further spot proximally on the tarsus; the tarsi tinged with tawny. Fore- and hind-wings, above and beneath, white; surface of the fore-wing on the upperside shiny, of the hind-wing dull; a small but distinct fuscous black spot on the centre of the discocellulars of the fore-wing, sometimes reproduced on the underside; costa of fore-wing, above and beneath, edged narrowly with tawny; fringes of both wings, above and beneath, russet, at the tornus white, the russet in most specimens slightly invading the wing surface.

♀. Resembles the ♂, but with paler antennae, and with less colour on palpus, head, legs and fringes.

Expanse: ♂♂ 28–37 mm.



Figs. 1–3.—1. *Redoa anser* sp. n. Right harpe and clasper; 2. *Redoa anserella* sp. n. Right harpe and clasper; 3. *Redoa phaeocraspeda* sp. n. Right harpe and clasper.

1 ♂ (holotype), 1 ♀ (allotype), 21 ♂♂, 4 ♀♀, April–October 1933, 900 metres, Hoeng-shan, Hunan.

Resembles *Redoa hipparia* Swinhoe (Singapore). They may be separated on the ♂ genitalia, which differ in several respects; in the present species the clasper is forked, whereas in *R. hipparia* it broadens distally and is unforked.

The ♀♀ may be separated from those of *R. anserella* by the presence of brown on the fringes, brown on the basal portion of the pectinations of the antennae, and veins Rs and M1 of the hind-wing arising separately or from a point, while in *R. anserella* they are shortly stalked.

Euproctis hoenei Collenette, 1934.

44 ♂♂, 1 ♀, Kiangsu. One ♂, which is otherwise normal, has both wings white instead of cartridge buff or pinkish buff.

The ♀, which has not previously been described, resembles the ♂ in markings; expanse 34 mm.

Euproctis melanoma sp. n. (pl. 1, fig. 19).

♂. Palpus fuscous black. Antennal shaft white, pectinations warm buff. Head, thorax, abdomen and legs white; the patagium tinged with light orange-yellow; anal tuft pinkish buff. Wings and fringes, above and beneath, white; on the upperside of fore-wing a narrow fuscous black postmedial fascia, almost straight, running from vein M1 near its origin to the inner margin at just over one half; the basal third of costa on underside of fore-wing edged with fuscous black.

♀. Resembles the ♂.

Expanse: ♂ 33 mm., ♀♀ 39–41 mm.

1 ♂ (holotype), August 1935, 1 ♀ (allotype) and 1 ♀ (paratype), September 1935, Li-kiang, North Yunnan.

Evidently allied to *Euproctis postincisa* Moore, but in the present species vein R2, after leaving the cell, touches the stalk of veins R3 to R5, thus forming a small areole.

Euproctis xuthonepha sp. n. (pl. 1, fig. 12).

♂. Palpus pale yellow orange, lighter at the tip. Antennal shaft white, pectinations pinkish buff. Thorax pale yellow-orange. Abdomen fuscous black; the basal segments pale pinkish buff, this colour in some specimens continued dorsally to the anal tuft, which is ochraceous buff. Pectus and legs whitish, venter fuscous black. Fore-wing pale yellow-orange, the costal area lighter; a broad orange buff antemedial fascia, the edges ill-defined, running from just below the costa to the inner margin; a broad orange buff postmedial fascia, the edges ill-defined, running from costa to inner margin, roughly parallel with the termen; fringe pale yellow orange. Hind-wing and fringe cartridge buff to cream buff. Underside of both wings and fringes cartridge buff, the fore-wing rather lightly tinged with cream buff.

Expanse: ♂♂ 34–36 mm.

1 ♂ (holotype) and 10 ♂♂ (paratypes), June 1935 and 1936, 1 ♂ (paratype), August 1936, 3000 metres, Tapaishan, Tsinling, South Shensi.

May be placed near to *Euproctis hoenei* Collenette.

Euproctis leucozona sp. n. (pl. 1, fig. 15).

♂. Palpus pinkish buff, on the outer side Prout's brown. Antennal shaft pale pinkish buff, pectinations pinkish buff. Head, thorax and basal segments of abdomen pale orange-yellow to light buff, remainder of abdomen bone brown, anal tuft orange buff. Pectus, venter and legs pale pinkish buff to pinkish buff. Fore-wing and fringe maize yellow; some sparse fuscous black irroration medially in the inner marginal area, above and below the anal vein, and not extending to the long hair-scales on the margin. Hind-wing and fringe pale pinkish buff. Underside of both wings and fringes pale pinkish buff, the costal and apical areas of the fore-wing tinged with maize yellow, and the base of the costa edged with Prout's brown.

♀. Resembles the ♂, but the Prout's brown at the base of the costa on the underside of fore-wing entirely absent in the type and the majority of other specimens.

Expanse: ♂♂ 41–45 mm., ♀♀ 50–54 mm.

1 ♂ (holotype), 1 ♀ (allotype), 1 ♀ (paratype), Siao-lou, 1896 and 1903; 2 ♀♀, Tsekou, 1898; 1 ♀, Tien-Tsuen, 1903; all Prov. Szechwan, British Museum collection, *ex* Oberthür collection. Also 1 ♂, July 1935, Likiang, Yunnan, and 1 ♀, July 1935, Tapaishan, South Shensi.

Resembles *Euproctis montis* Leech, described from Chang Yang, but larger and brighter, and with the irroration on the fore-wing confined to the area above and below the anal vein.

Euproctis mesostiba sp. n. (pl. 1, figs. 8, 10).

♂. Palpus warm buff, on the outer side buffy brown. Antennal shaft clay colour, pectinations tawny olive. Body and legs light orange-yellow. Fore-wing light orange-yellow; a broad medial fascia of wood brown, irrorated sparsely with sepia, not quite reaching the costa, and in the majority of specimens not reaching the inner margin; on the distal margin of the fascia a rounded projection between veins M2 to Cu1; some light metallic scales, placed interneurally, midway between the discocellulars and the termen, visible only in fresh specimens; fringe light orange-yellow. Hind-wing pale orange-yellow, the fringe somewhat lighter. Underside of both wings, and fringes, pale orange-yellow; on the fore-wing a large rounded patch of wood brown, its centre slightly on the distal side of the discocellulars.

♀. Resembles the ♂, but with the fascia on the fore-wing less prominent, and the patch of wood brown on the underside of the fore-wing either absent or very faintly indicated.

Expanse: ♂♂ 21–28 mm., ♀♀ 29–38 mm.

1 ♂ (holotype), 1 ♀ (allotype), 25 ♂♂ and 12 ♀♀ (paratypes), April–September 1933, Lungtan, near Nanking, Kiangsu.

Superficially resembles *Euproctis tetrachroma* Joannis. Vein M3 is absent in the hind-wing.

Euproctis hunanensis sp. n. (pl. 1, fig. 9).

♂. Palpus pale yellow-orange, marked on the outer side with ochraceous tawny. Antenna pinkish buff. Head, thorax and base of abdomen pale orange-yellow to light orange-yellow, remainder of abdomen, pectus, venter and legs light buff to warm buff. Fore-wing pale orange-yellow; basal two-thirds of wing, excepting for a strip along the costa, wood brown irrorated with sepia, and with a narrow antemedial fascia, of pale orange-yellow, running oblique outwardly across the cell, thence straight and slightly oblique inwardly to the inner margin; the distal margin of the wood brown area is roughly parallel to the termen, with an isolated spot of the same colour subterminally between veins R5 and M1, a projection between veins M3 and Cu1 which almost reaches the termen, and a further projection above and below the anal vein which reaches the tornus; fringe light buff. Hind-wing and fringe light buff, the inner marginal area of the wing tinged with warm buff. Underside of both wings and fringes light buff.

Expanse: ♂♂ 29–31 mm.

1 ♂ (holotype), and 1 ♂ (paratype), September 1933, 900 metres, Hoengshan, Hunan.

Somewhat resembles *Euproctis piperita* Oberthür, but possesses vein M2 in the hind-wing.

Euproctis niphonis Butler, 1881.

1 ♂, 1 ♀, South Shensi. This pair is larger than Japanese and Usuri specimens (♂ 48 mm., ♀ 52 mm.), the termen of the fore-wing is less rounded, and the ground colour of both wings in the ♀ light buff rather than yellow.

Euproctis scintillans Walker, 1856.

8 ♂♂, 7 ♀♀, Hunan; 13 ♂♂, 3 ♀♀, South Shensi; 1 ♂, Chekiang. The insects in the series from Hunan are darker and usually smaller than those from South Shensi.

Euproctis marginata Moore, 1879.

1 ♂, 1 ♀, North Yunnan. The ♂ is intermediate between the typical form and form *E. marginata diffusefasciata* Gaede, 1932.

Lymantria mathura Moore, 1865, and ♂ form *fusca* Leech, 1888.

1 ♂, Shensi; 29 ♂♂, 2 ♀♀, Chekiang. The ♂♂ from Chekiang show a full gradation in colour of wings from the very dark form *fusca* Leech to a specimen approaching the normal ♂ with yellow hind-wing.

Lymantria nebulosa Wileman, 1910.

2 ♂♂, Hunan; 15 ♂♂, 8 ♀♀, Kiangsu; 3 ♂♂, 3 ♀♀, Chekiang. Average specimens are smaller than those from Formosa, but the differences are not sufficient to allow separation.

Laelia pantana sp. n. (pl. 1, figs. 17, 18).

♂. Palpus drab, on the outer side darker. Antenna hair brown. Head, thorax above and beneath, and legs drab. Abdomen above and beneath pale pinkish buff. Fore-wing Saccardo's umber, mixed with pale pinkish buff in the cell and the area from the cell to the inner margin; a postmedial series of seven fuscous black interneural spots, the one between veins M2 and M3 more proximad than those above and below; fringe Saccardo's umber. Hind-wing and fringe whitish. Underside of fore-wing and fringe drab, the area between the cell, vein Cu2 and the inner margin drab. Underside of hind-wing, and fringe, whitish; a faint line of cinnamon buff along the termen, extending to the costa.

♀. Wings and fringes white, the veins on the upperside thinly scaled and therefore easily visible.

Expanse: ♂♂, 39–42 mm., ♀, 42 mm.

1 ♂ (holotype) and 1 ♀ (allotype), 2000 metres, July, Liu-pin-schan, Tsing-schui, Kansu, in British Museum collection; 6 ♂♂ (paratypes), 1700 metres, July 1936, Tapaishan, Tsinling, South Shensi.

A very distinct species, superficially resembling *Pantana baswana* Moore.

Laelia lilacina Moore, 1884.

2 ♂♂, Hunan; 3 ♂♂, 1 ♀, Kiangsu. The spots on the fore-wing of the ♂ are less prominent, and the colour of the hind-wing lighter, than in the type from the Nilgiris.

Dasychira leucomene sp. n. (pl. 1, fig. 2).

♂. Palpus pinkish buff, on the outer side mummy brown. Antennal shaft tilleul buff, irrorated with mummy brown; pectinations tawny. Head, thorax, abdomen and legs tilleul buff mixed with pinkish buff and mummy brown, the tarsi banded with mummy brown.

Fore-wing tilleul buff mixed with Brussels brown, and with the following pattern in the latter colour: an irregular subbasal fascia; an antemedial fascia, crenate, concavities basad, running at right angles to the inner margin; a mark on the discocellulars, roughly crescent-shaped, convexity basad, tilleul buff edged with Brussels brown; a crenate postmedial fascia, concavities terminad, bowed from costa to vein Cu2, thence slightly oblique outwardly to the inner margin; a crenate preterminal fascia, indistinct in some specimens; fringe tilleul buff, with a series of prominent mummy brown spots interneurally. Hind-wing drab: a darker mark on the discocellulars, and an incomplete postmedial fascia parallel with the termen; fringe lighter than the wing, with a series of dark spots interneurally. Underside of both wings tawny olive, with a mummy brown mark on the discocellulars, and with traces of a postmedial fascia on the hind-wing; fringes lighter than the wings, with a series of small mummy brown spots interneurally at the base.

Expanse: ♂♂, 44–51 mm.

1 ♂ (holotype) and 7 ♂♂ (paratypes), September 1935, Li-kiang, North Yunnan.

Related to *Dasychira wilemani* Collenette, but a larger insect with relatively broader wings.

Dasychira complicata Walker, 1865.

19 ♂♂, South Shensi. These ♂♂ have a lighter fore-wing than Indian specimens, and the hind-wing is less deeply tinged with yellow.

Dasychira phloeobares sp. n. (pl. 1, fig. 1).

♂. Palpus tawny olive, on the outer side bistre. Antennal shaft bistre, the pectinations snuff brown. Head and thorax bistre. Abdomen tawny olive, with basal dorsal tufts of bistre. Pectus, venter and legs tawny olive, mixed on fore and middle legs with bistre. Fore-wing pinkish buff, irrorated heavily with bistre; some bistre markings subbasally; a bistre antemedial fascia, outwardly oblique from the costa to the centre of the cell, thence dividing into two and running inwardly oblique and almost straight to the inner margin; a crescent-shaped mark on the discocellulars, concavity terminad; a bistre postmedial fascia, double throughout, running almost straight and parallel with the termen from the costa at two-thirds to below vein Cu2, thence curving outwardly to the inner margin at three-fourths; a rather prominent bistre subterminal fascia, broken at some of the veins; fringe pinkish buff mixed with bistre. Hind-wing tawny olive mixed with Saccardo's umber, a dark spot on the discocellulars and a broad dark postmedial fascia; fringe tawny olive. Underside of both wings tawny olive mixed with Saccardo's umber; a dark spot on the discocellulars and a straight postmedial fascia, the latter on the hind-wing being double; fringe of both wings pinkish buff, Saccardo's umber between the vein-ends.

♀. Resembles the ♂, but apparently lacking the dorsal tufts at the base of the abdomen.

Expanse: ♂ 42 mm., ♀ 48 mm.

1 ♂ (holotype) and 1 ♀ (allotype), June and September 1933, Lungtan, near Nanking, Kiangsu; 1 ♂, May 1936, 1700 metres, Tapaishan, Tsinling, South Shensi.

The arrangement of the fasciae in the fore-wing somewhat resembles *D. polysphena* Collenette. Most nearly related to *Dasychira conjuncta* Wileman, from which it can be readily separated by the shape of the postmedial fascia in the fore-wing.

Dasychira chekiangensis sp. n. (pl. 1, fig. 5).

♂. Palpus snuff brown. Antennal shaft snuff brown, pectinations sayal brown. Head and thorax sayal brown, mixed on the tegula with bistre. Abdomen pinkish buff mixed with snuff brown, and with fuscous black dorsal tufts on the basal segments. Pectus, venter and legs sayal brown, the legs marked on the outer side with bistre. Fore-wing bistre, dusted with pale violet plumbeous; a fuscous antemedial fascia, slightly bowed (concavity basad) almost to the anal vein, thence outwardly oblique to the inner margin; a conspicuous patch of sayal brown on the discocellulars, extending upwards to the costa and crossing the postmedial fascia; a further patch of sayal brown along the inner margin from the antemedial to the postmedial fascia; a fuscous postmedial fascia, crenate, points on the veins, concavities basad, slightly bowed from costa to vein Cu2, thence running at right angles to the inner margin; a sayal brown subterminal fascia, corresponding to the postmedial fascia in form; fringe bistre, lighter at the vein-ends. Hind-wing and fringe drab, with traces of darker postmedial and subterminal fasciae. Underside of fore-wing drab, a darker shade in the cell and an almost straight postmedial fascia; fringe bistre, lighter at the vein-ends. Underside of hind-wing drab; a dark spot on the discocellulars, a postmedial fascia almost parallel with the termen, and some dark spots midway between the postmedial fascia and the termen; fringe drab.

Expanse: ♂♂ 34–41 mm.

1 ♂ (holotype) and 9 ♂♂ (paratypes), May and June 1932, 1600 metres, West Tien-mu-shan, Chekiang.

May be placed near to *Dasychira glaucinoptera* Collenette and *D. planozona* Collenette.

Dasychira anophoeta Collenette, 1936.

38 ♂♂, 4 ♀♀ (including neallotype ♀), North Yunnan. The ♀ strongly resembles the ♂, but has a darker hind-wing.

Dasychira chinensis hunanensis subsp. n. (pl. 1, fig. 4).

♂. Easily distinguished from *D. chinensis chinensis* Swinhoe by the lilac grey coloration in the postmedial and terminal areas of the fore-wing, and by the appearance of the fringes, which on the upperside of both wings are Prout's brown, marked with tilleul buff at the vein-ends.

Expanse: ♂♂ 42–50 mm.

1 ♂ (holotype) and 15 ♂♂ (paratypes), 900 metres, May–August 1933, Hoeng-shan, Hunan; also 1 ♂, August 1932, 1600 metres, West Tien-mu-shan, Chekiang; and, in the British Museum collection, 1 ♂, June–July 1890, Kwei-chow, ex Leech collection.

Dasychira nox sp. n. (pl. 1, figs. 3, 6).

♂. Palpus tawny olive, on the outer side sepia. Antenna, head, body and legs sepia to bistre. Fore-wing sepia; a faintly indicated darker streak on the discocellulars; a dark postmedial fascia, slightly bowed, concavity terminad, from costa to vein Cu2, thence running at right angles to the inner margin; fringe sepia, with a few pinkish buff scales at the ends of the veins. Hind-wing bistre, the fringe somewhat lighter; a light streak in the basal half of the costal area. Underside of both wings, and fringes, bistre, with faintly indicated darker marks on the discocellulars, and with postmedial and subterminal fasciae.

♀. Lighter in colour than the ♂, with two whitish patches on the costa of the fore-wing, one antemedially and the other postmedially.

Expanse: ♂♂ 34–39 mm., ♀ 44 mm.

1 ♂ (holotype), 1 ♀ (allotype), and 4 ♂♂ (paratypes), April 1933, 900 metres, Hoeng-shan, Hunan.

The ♂ somewhat resembles *Dasychira mocrens* Felder, but has considerably narrower wings.

Dasychira jankowskii glaucoptera Collenette.

94 ♂♂, 1 ♀, Hunan; 20 ♂♂, South Shensi; 8 ♂♂, Kiangsu; 1 ♂, Chekiang. The insects in the series from Kiangsu are darker and smaller (average expanse 31 mm.) than those from the other localities, although two or three specimens in the Hunan series are not separable from them.

Dasychira locuples Walker, 1855 (pl. 1, fig. 13).

86 ♂♂, 4 ♀♀, Hunan; 64 ♂♂, 1 ♀, South Shensi; 1 ♂, Kiangsu; 5 ♂♂, Chekiang.

In addition to the above, a series from North Yunnan is composed of insects appreciably larger and lighter than those from the other localities, the colour of the fore-wing being raw sienna, and the expanse of the ♂♂ varying between 44 and 47 mm., with an average of over 45 mm. The average expanse of *D. locuples locuples* Walker from Hunan and Shensi is about 38 mm. Moreover, in the North Yunnan examples, the inner and outer edges of the antemedial fascia meet or almost meet where they join the inner margin, while in the specimens from other areas the edges are almost parallel. I name this insect, which appears to be a local race, **Dasychira locuples yunnanensis** subsp. n. 1 ♂ (holotype) and 17 ♂♂ (paratypes), July–September 1935, Li-kiang, North Yunnan.

Numenes disparilis separata Leech, 1890.

25 ♂♂, South Shensi. The series is uniform, excepting that the white spot near the base of the costa in the fore-wing is rather large in some specimens and almost obsolete in others.

Locharna strigipennis Moore, 1879.

6 ♂♂, 27 ♀♀, Kiangsu; 1 ♀, Chekiang. The fore-wing in both sexes is slightly broader, and the apex less pointed, than in Indian specimens.

Orgyia convergens sp. n. (pl. 1, fig. 11).

♂. Strongly resembles *Orgyia parallela* Gaede, but much smaller and with the antemedial and postmedial fasciae of the fore-wing converging at veins Cu1 and Cu2. The white tornal spot on the fore-wing is small, and there is no trace of pale grey at the centre of the costa.

Expanse: ♂♂ 26–29 mm.

1 ♂ (holotype) and 3 ♂♂ (paratypes), July and August 1905 and 1907, Peitaiho, Yunnan, British Museum *ex* Joicey collection; 1 ♂, June 1936, Sianfu, Tsinling, South Shensi.

Leucoma salicis candida Staudinger, 1892. 1 ♂, 1 ♀, Hunan; 31 ♂♂, 3 ♀♀, North Yunnan; 16 ♂♂, 5 ♀♀, South Shensi; 4 ♂♂, 2 ♀♀, Kiangsu.
Leucoma chrysoscela Collenette, 1934. 2 ♀♀, Chekiang.
Leucoma sericea horridula Collenette, 1934. 8 ♀♀, Chekiang.
Caragolina costalis Moore, 1879. 3 ♂♂, North Yunnan.
Arctornis gelasphora Collenette, 1935. 37 ♂♂, 37 ♀♀, North Yunnan.
Arctornis ceconimena Collenette, 1935. 2 ♀♀, North Yunnan.
Redoa alba Bremer, 1861. 31 ♂♂, 46 ♀♀, Kiangsu.
Redoa cygnopsis Collenette, 1934. 3 ♂♂, 3 ♀♀, Hunan.
Redoa diaphora Collenette, 1934. 2 ♂♂, Hunan; 1 ♂, Chekiang.
Ivela auripes Butler, 1877. 1 ♂, 6 ♀♀, South Shensi.
Euproctis similis Fuessly, 1775. 17 ♂♂, 18 [illegible], Hunan; 4 ♂♂, 17 [illegible], South Shensi; 38 ♂♂, 32 ♀♀, Kiangsu.
Euproctis bigutta Walker, 1855. 1 ♂, Chekiang.
Euproctis glaphyra Collenette, 1935. 7 ♂♂, North Yunnan.
Euproctis varians Walker, 1855. 1 ♂, Shantung; 21 ♂♂, 37 [illegible], Kiangsu.
Euproctis coniptera Collenette, 1934. 2 ♂♂, Kiangsu; 3 ♂♂, 1 [illegible], Chekiang.
Euproctis conistica Collenette, 1935. 44 ♂♂, 5 [illegible], North Yunnan.
Euproctis montis Leech, 1890. 29 ♂♂, 12 ♀♀, South Shensi; 2 ♀♀, Chekiang.
Euproctis torasan Holland, 1889. 4 ♂♂, Hunan.
Euproctis brachyclaena Collenette, 1935. 5 ♂♂, North Yunnan.
Euproctis subflava Bremer, 1864. 11 ♂♂, 6 ♀♀, Hunan; 1 ♂, 1 ♀, South Shensi; 91 ♂♂, 13 ♀♀, Kiangsu; 7 ♂♂, Chekiang.
Euproctis flavinata Walker, 1865. 9 ♂♂, 23 ♀♀, Hunan; 19 ♂♂, 23 ♀♀, Kiangsu.
Euproctis fraterna Moore, 1883. 1 ♂, Hunan.
Euproctis electrophaes Collenette, 1935. 1 ♂, 1 ♀, North Yunnan.
Euproctis angulata Matsumura, 1927. 2 ♂♂, Hunan; 1 ♂, Chekiang.
Euproctis pseudoconspersa Strand, 1923. 2 ♂♂, 1 ♀, Chekiang.
Euproctis flavotriangulata Gaede, 1932. 1 ♂, 3 ♀♀, South Shensi.
Euproctis nigrifulva Gaede, 1932. 5 ♂♂, 1 ♀, North Yunnan.
Euproctis varia Walker, 1855. 2 ♂♂, North Yunnan.
Euproctis piperita Oberthür, 1880. 12 ♂♂, 6 ♀♀, Hunan; 202 ♂♂, 21 ♀♀, South Shensi.
Euproctis bipunctapex Hampson, 1891. 2 ♀♀, Hunan; 8 ♂♂, 6 ♀♀, Kiangsu.
Euproctis plana Walker, 1856. 4 ♂♂, 2 ♀♀, Hunan.
Medama diplaga Hampson, 1910. 10 ♂♂, North Yunnan.
Topomesoides jonasii Butler, 1877. 7 ♂♂, Hunan; 1 ♀, Chekiang.
Lymantria monacha Linnaeus, 1758. 7 ♂♂, Chekiang.
Lymantria concolor lacteipennis Collenette, 1933. 3 ♂♂, 1 ♀, South Shensi; 1 ♂, Chekiang.
Lymantria marginata Walker, 1855. 11 ♀♀, South Shensi.
Lymantria serva Fabricius, 1793. 25 ♂♂, 5 ♀♀, North Yunnan; 2 ♀♀, South Shensi; 3 ♂♂, Chekiang.
Lymantria servula Collenette, 1935. 1 ♂, North Yunnan.
Lymantria dispar asiatica Vnukovskij, 1926. 2 ♂♂, South Shensi; 9 ♂♂, 1 ♀, Kiangsu.
Lymantria nigriplagiata Gaede, 1932. 1 ♂, 1 ♀, Shanghai; 3 ♂♂, 3 ♀♀, Kiangsu; 1 ♀, Chekiang.
Lymantria dissoluta Swinhoe, 1903. 30 ♂♂, 32 ♀♀, Hunan; 5 ♂♂, 8 ♀♀, Kiangsu.
Lymantria argyrochroa Collenette, 1935. 2 ♂♂, 1 ♀, North Yunnan.
Lymantria furva Leech, 1888. 12 ♂♂, 2 ♀♀, Hunan; 4 ♀♀, South Shensi; 2 ♂♂, Shantung.
Laelia coenosa candida Leech, 1899. 10 ♂♂, 15 ♀♀, Kiangsu.
Laelia coenosa sangaica Moore, 1877. 3 ♂♂, 7 ♀♀, Kiangsu.
Laelia anamesa Collenette, 1934. 13 ♂♂, 17 ♀♀, Hunan; 1 ♀, Kiangsu.
Laelia monoscola Collenette, 1934. 1 ♂, Chekiang.

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Chinese Lymantriidae.

Dasychira axutha Collenette, 1934. 32 ♂♂, 11 ♀♀, Hunan; 1 ♂, 1 ♀, South Shensi; 1 ♀, Kiangsu,; 4 ♂♂, 1 ♀, Chekiang.
Dasychira grotei Moore, 1859. 33 ♂♂, 1 ♀, Hunan.
Dasychira virginea Oberthür, 1879. 7 ♂♂, 2 ♀♀, South Shensi; 1 ♂, Kiangsu.
Dasychira lunulata Butler, 1877. 5 ♂♂, 2 ♀♀, South Shensi; 1 ♂, 1 ♀, Chekiang.
Dasychira oxygnatha Collenette, 1936. 10 ♂♂, North Yunnan; 5 ♂♂, South Shensi.
Dasychira strigata Moore, 1879. 4 ♂♂, North Yunnan; 52 ♂♂, 4 ♀♀, South Shensi; 2 ♂♂, Chekiang.
Dasychira angulata Hampson, 1895. 1 ♂, 1 ♀, Hunan; 1 ♀, Chekiang.
Dasychira hoenei Collenette, 1935. 6 ♂♂, 1 ♀, North Yunnan.
Dasychira simiolus Collenette, 1935. 2 ♂♂, 1 ♀, North Yunnan.
Dasychira polysphena Collenette, 1935. 2 ♀♀, North Yunnan.
Dasychira planozona Collenette, 1935. 2 ♀♀, North Yunnan; 2 ♂♂, South Shensi.
Dasychira feminula feminula Hampson, 1891. 3 ♂♂, South Shensi; 21 ♂♂, 2 ♀♀, Chekiang.
Dasychira feminula likiangensis Collenette, 1935. 70 ♂♂, North Yunnan.
Dasychira flavimacula Moore, 1865. 2 ♂♂, North Yunnan; 1 ♀, South Shensi.
Dasychira tenebrosa Walker, 1865. 10 ♂♂, North Yunnan; 1 ♂, South Shensi.
Dasychira nachiensis Marumo, 1917. 3 ♀♀, North Yunnan; 8 ♀♀, Chekiang.
Dasychira psolobalia Collenette, 1935. 2 ♂♂, 1 ♀, North Yunnan.
Dasychira pilodes Collenette, 1935. 10 ♂♂, 13 ♀♀, North Yunnan.
Dasychira melli Collenette, 1934. 4 ♂♂, 4 ♀♀, Hunan; 6 ♂♂, Chekiang.
Psalis pennatula Fabricius, 1793. 5 ♂♂, 1 ♀, North Yunnan.
Pseudodura dudgeoni Swinhoe, 1907. 16 ♂♂, Chekiang.
Numenes disparilis Staudinger, 1887. 1 ♀, Chekiang.
Pantana delineata Walker, 1855. 2 ♀♀, Kiangsu.
Pantana sinica Moore, 1877. 5 ♂♂, 1 ♀, Hunan.
Pantana pluto Leech, 1890. 1 ♂, Hunan.
Orgyia ericae leechi Kirby, 1892. 22 ♂♂, South Shensi.
Orgyia gonostigma approximans Butler, 1881. 1 ♂, South Shensi.

Explanation of Plate 1.

Fig. 1. *Dasychira phloeobares* sp. n., holotype ♂. (p. 217.)
2. *Dasychira leucomene* sp. n., holotype ♂. (p. 216.)
3. *Dasychira nox* sp. n., allotype ♀. (p. 218.)
4. *Dasychira chinensis hunanensis* subsp. n., holotype ♂. (p. 218.)
5. *Dasychira chekiangensis* sp. n., holotype ♂. (p. 218.)
6. *Dasychira nox* sp. n., holotype ♂. (p. 218.)
7. *Redoa phaeocraspeda* sp. n., holotype ♂. (p. 213.)
8. *Euproctis mesostiba* sp. n., allotype ♀. (p. 215.)
9. *Euproctis hunanensis* sp. n., holotype ♂. (p. 215.)
10. *Euproctis mesostiba* sp. n., holotype ♂. (p. 215.)
11. *Orgyia convergens* sp. n., holotype ♂. (p. 219.)
12. *Euproctis xuthonepha* sp. n., holotype ♂. (p. 214.)
13. *Dasychira locuples yunnanensis* subsp. n., holotype ♂. (p. 219.)
14. *Arctornis hemilabda* sp. n., holotype ♂. (p. 211.)
15. *Euproctis leucozona* sp. n., holotype ♂. (p. 214.)
16. *Redoa anser* sp. n., paratype ♂. (p. 212.)
17. *Laelia pantana* sp. n., holotype ♂. (p. 216.)
18. *Laelia pantana* sp. n., allotype ♀. (p. 216.)
19. *Euproctis melanoma* sp. n., holotype ♂. (p. 214.)
20. *Redoa anserella* sp. n., holotype ♂. (p. 212.)

ON A FURTHER TWO NEW PALAEARCTIC SPECIES OF *APANTELES* (HYM. BRAC.)

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These two new interesting species will not agree with the original description of any described palaearctic species, by far the greater majority of the types of which, incidentally, are known to me. They are published at this time especially to preclude the necessity of describing them as new in the monograph that I have in preparation, but also to make the names available for my many kind correspondents.

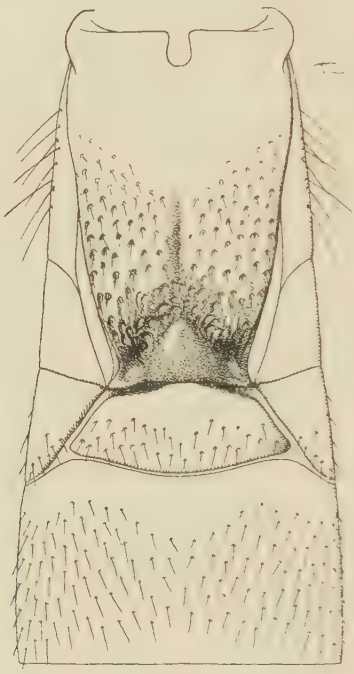

Fig. 1.—*Apanteles dioryctriae* sp. n., basal tergites, ♀. × 80.

Apanteles dioryctriae sp. n.

♀. Black; certain portions of the front trochanters and trochantines, front femora in apical half (except perhaps above and below), front tibiae (save along outer margin), front tarsi (save for darkened apical joint and feet), middle and hind tibiae in basal fifth, testaceous or red testaceous; palpi pale; tibial spurs pale or white; wings infumated, the setae coloured; wing-veins, stigma, and metacarp, brown, the costal veins basally to a small extent testaceous; stigma uniformly opaque.

♂. Agrees closely with above colour-description of ♀, but rather variable in colour of legs; many specimens as in ♀, others with the legs darker and with the extent of the testaceous markings smaller, some few even with the legs apparently entirely darkened or black.

♀♂. *Head*: face, clypeus, frontal orbits, frons, and vertex, throughout regularly, minutely punctate (degree 1) ; facial depressions just nearer to apex of clypeus than to the eyes; posterior ocelli equidistant from each other and the eyes; flagellum of ♀ about equal to combined length of thorax and abdomen, of ♂ equal to combined length of head, thorax, and abdomen. *Thorax*: mesonotum and disc of scutellum throughout regularly, minutely punctate (degree 1) and with the lines of the notauli not indicated; the non-excavate area of lateral faces of scutellum small and hardly reaching up half-way to base of scutellum;

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FIG. 2.—*Apanteles dioryctriae* sp. n., apical ventrites, ♀: side view, × 80; and apex of hypopygium, opened out, dorsal view, further much enlarged, to show apical slit.

propodeon largely entirely smooth, minutely punctate (degree 1) in the basal half (save medianly), sometimes weakly aciculate laterally in apical half, and invariably with a mass of short, weak carinae radiating from the median apical lunule. *Wings*: 1st abscissa of radial somewhat longer than, and strongly angled with, the transverse cubital, these veins swollen at their point of junction, or even with a vestigial 2nd abscissa of radial; metacarp longer than stigma. *Legs*: hind coxae basally above with a large group of ill-defined, closely placed punctures (degree 3), apically above minutely punctate (degree 1), and on outer faces with widely separated minute punctures (degree 1); the longer hind tibial spur somewhat longer, and the shorter spur somewhat shorter, than half the length of the basal segment of the hind tarsus (18 : 14 : 32). *Abdomen* (figs. 1–3): 1st tergite in basal half excavate and smooth save for some indefinite sculpture laterally, medianly smooth and not tumescent, in apical half turned over and broadly punctate (degree 2) down sides and medianly very slightly depressed, at apex strongly contracted and the apical angles deeply depressed, the median apical lunule delimitated by weak rugosity; 2nd tergite minutely punctate (degree 1) in at least apical half, and with well-marked sulci, otherwise entirely smooth; 3rd tergite entirely smooth broadly across base and in a median basal triangle, and narrowly across apex, otherwise minutely punctate; succeeding tergites minutely punctate; majority of ventrites of ♀ with median longitudinal suture; hypopygium more or less broadly membranous throughout the median line, and its apex membranously acute; ovipositor sheaths longer than hind tarsus, about equal to or just a little longer than combined length of hind tibia and basal segment of hind tarsus, the ovipositor longer

than combined length of hind tibia and hind tarsus, somewhat longer than combined length of hind femur, hind tibia, and the two basal segments of the hind tarsus.

Length: ♀, 3·0–3·5 mm.; ♂, 2·5–3·5 mm.

Described from the following material:—Imperial Institute of Entomology: Morocco, Ifrane, 18 ♀♀ (one the *type*), 6 ♂♂, 19.viii.–10.x.1937 (*J. M. Mimeur*), Ifrane, St. B.V. 1650 m., 12 ♀♀, 18 ♂♂, 1ère-quinz. x.1936 (*J. M. Mimeur*).

Type deposited in the British Museum.

Host. The host of this species is recorded to be the Pyralid *Dioryctria peyerimhoffi* de Joann., mining in young cones of the cedar, *Cedrus atlantica*. In his covering letter, when he sent his material, M. Mimeur said: "Lors de quelques séjours effectués cet été à la Station de Biologie végétale d'Ifrane, j'ai remarqué dans les jeunes fruits des Cèdres, de petites chenilles qui récoltées en vue de leur élevage m'ont presque toutes donné les *Apanteles* que vous avez reçus. Ces hyménoptères nymphosaient sur ou à l'intérieur du cône de cèdre miné par leur proie. La plupart des chenilles non parasitées sont mortes: elles ont, malgré mes précautions, subi l'hiver doux et humide du littoral atlantique au lieu du froid sec de la montagne marocaine. . . . Ifrane se trouve dans le Moyen Atlas à environ 60 km. au sud de Meknes, son altitude va de 1500 à 1700 m.; quelques sujets ont été obtenus d'une station voisine 'Tizi N'Tretten' 2000 m."

Cocoons white.

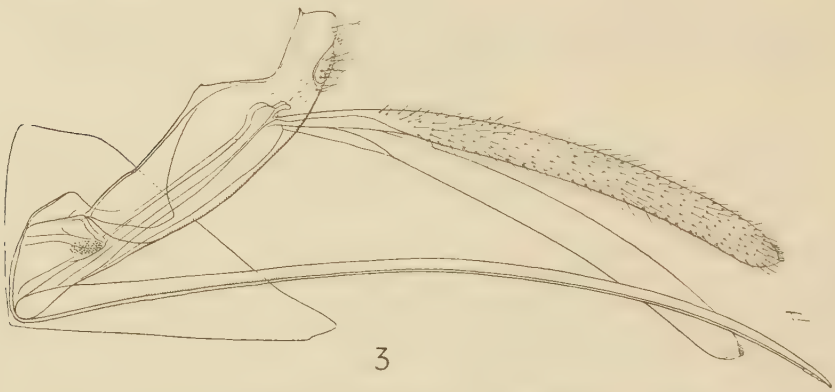


Fig. 3.—*Apanteles dioryctriae* sp. n., genitalia, ♀. × 40.

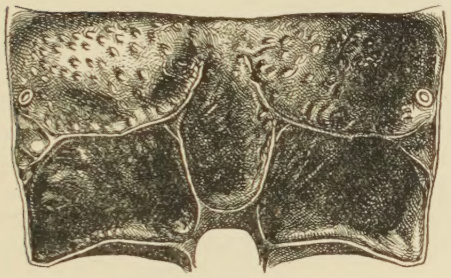
In Marshall's key (1888) this species runs to couplet 16 in Marshall's Section 2, but no further; and in Muesebeck's key (1920) of the nearctic species it would appear to run to *victoriae* Mues., with the description of which, however, it does not entirely agree. In my own key (1932, *Trans. ent. Soc. Lond.* **80**, and as subsequently emended from time to time) it runs easily to couplet 119, which should be altered as follows:—

119. Tegulae testaceous; Tanganyika, Uganda . . . . . *sagax* Wilkn.
Tegulae dark . . . . . 119a.

119a. Hind femora largely red testaceous; 3rd tergite with only a single, complete, transverse row of, and some few other, minute punctures; India . . . . . *calycinae* Wilkn.
Hind femora black; 3rd tergite with extensive minute punctation; Morocco . . . . . *dioryctriae* Wilkn.

Apanteles coleophorae sp. n.

♀. Black; apical half of front femora (except sometimes above and below), front tibiae wholly, front tarsi (save for darkened feet and apical joint), middle femora at extreme apex, middle tibiae basally or in basal third or sometimes half, middle tarsi to a varying extent, hind trochantines below occasionally, hind tibiae basally or in the basal third, red testaceous; the middle tarsi vary between completely red testaceous (save for usual darkened apical joint and feet) and completely darkened; palpi pale; tibial spurs white; wings hyaline or faintly infumated, the setae coloured in apical three-fifths of all wings and apparently white in basal two-fifths; costal veins apically, stigma, metacarp, 1st abscissa of radial, transverse cubital, and 2nd abscissa of cubital, light red-brown, the costal veins basally red testaceous, and the remaining veins pale to colourless; stigma uniformly opaque.



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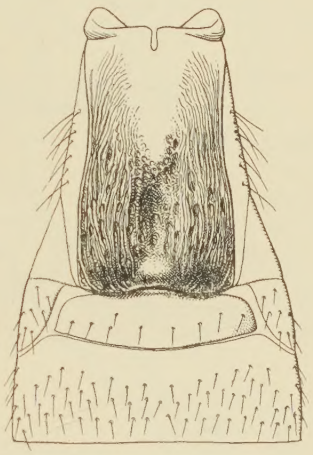

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FIGS. 4–5.—4. *Apanteles coleophorae* sp. n., propodeon; 5. *Apanteles coleophorae* sp. n., basal tergites, ♀. × 80.

♂. Black; front femora in apical third, front tibiae more or less throughout the inner margin, front tarsi to some extent (save for the black apical joint and feet), middle femora at apex, middle tibiae at base, middle tarsi to some extent (save for the black apical joint and feet), and hind tibiae at base, red testaceous; palpi pale; tibial spurs white; wings white hyaline, the setae white; metacarp, margins of the stigma, and certain portions of the costal veins, brown, the 1st abscissa of the radial, transverse cubital, and 2nd abscissa of cubital, weakly coloured, the remaining veins colourless; stigma otherwise hyaline.

♀♂. *Head*: face and clypeus closely punctate (degree 2); facial depressions nearer to apex of clypeus than to the eyes; frons and vertex minutely punctate; posterior ocelli about equidistant from each other and the eyes; flagellum of ♀ just longer than combined length of head, thorax, and abdomen, of ♂ longer than combined length of thorax and abdomen together with twice the length of the head, even approaching combined length of thorax and abdomen together with three times length of head. *Thorax*: mesonotum throughout regularly punctate (degree 3) and the lines of the notauli scarcely if at all indicated, narrowly across apex entirely smooth or with only exceedingly minute punctures (degree 1); disc of scutellum with only some few widely separated exceedingly minute punctures; the non-excavate area of lateral faces of scutellum reaching up only about half-way to base of

scutellum; propodeon *figured* (fig. 4). *Wings* : the 1st abscissa of the radial longer than, and but slightly angled with, the transverse cubital; metacarp longer than stigma. *Legs* : hind coxae basally above with a large group of separated, strong punctures (degrees 3 and 4), apically above and on outer faces throughout with regularly placed, widely separated, exceedingly minute punctures (degree 1); the hind tibial spurs subequal, the longer spur

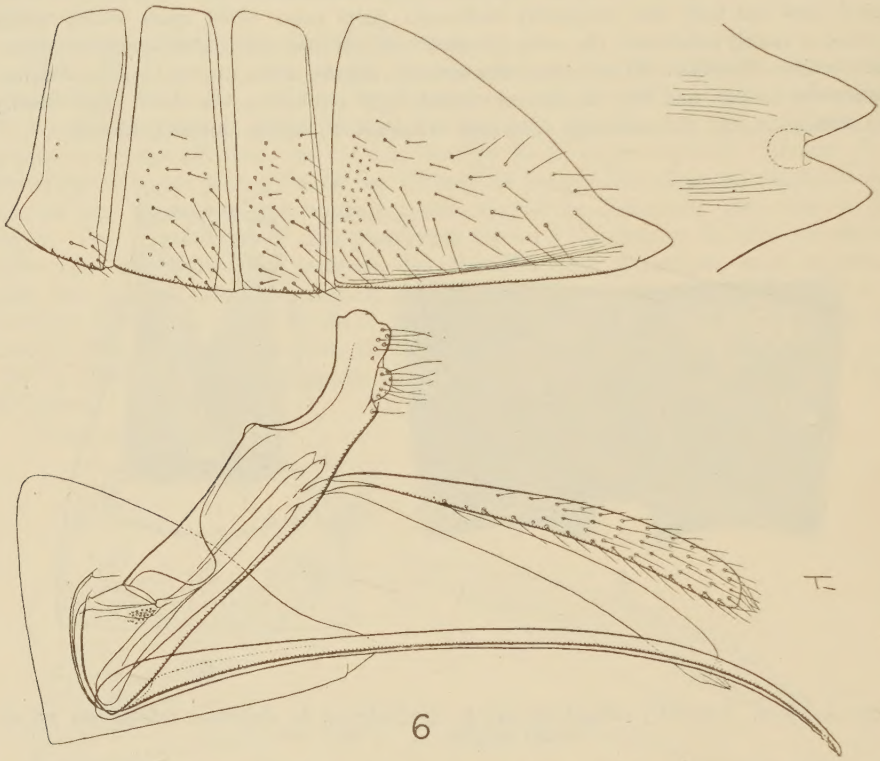

FIG. 6.—*Apanteles coleophorae* sp. n., apical ventrites and, below, genitalia, side view, ♀, × 80; and apex of hypopygium, opened out, dorsal view, further much enlarged, to show apical slit.

half, or just less than half, the length of the basal segment of the hind tarsus. *Abdomen* (figs. 5–6) : 1st tergite basally excavate and smooth save for striation along sides, medianly with a minutely rugose but not always strongly marked tumescence, apically turned over and rugose and striate and with some few strong punctures, but the sculpture often weak, a large median area noticeably depressed, the smooth median apical lunule never in evidence, in the ♂ the tergite narrower than in the ♀ and more usually much smoother and with the median tumescence often wanting; 2nd tergite with a row of minute punctures across centre and with not very well-marked sulci, otherwise smooth save often for some extremely indefinite sculpturing, in the ♂ the tergite narrower than in ♀; 3rd tergite entirely smooth broadly across base and narrowly across apex, otherwise minutely punctate; succeeding tergites minutely punctate; majority of ventrites of ♀ with median longitudinal suture; hypopygium more or less broadly membranous throughout the median line, and its apex membranously acute; ovipositor sheaths longer than combined length of the three basal segments of the hind tarsus but shorter than combined length of the four basal segments,

the ovipositor longer than the hind tarsus, rather shorter than combined length of hind tibia and the two basal segments of the hind tarsus.

Length, 2·0–2·7 mm.

Described from the following material:—G. SALT'S COLLECTION: 1 ♀, 5 ♂♂, vi.1936 (*J. L.*), England, 19 ♀♀, 8 ♂♂, 1936 (*Miss J. Laing*). D. S. WILKINSON'S COLLECTION: Balcombe, Sussex, England, 1 ♀, 1 ♂, 22.vi.1937 (*H. M. Edelsten*); Cambridge, England, 21 ♀♀ (one the *type*), 26 ♂♂, coll. 8.vi.1937, em. 6.vii.1937 (*R. L. E. Ford*); Bexley, Kent, England, 3 ♀♀, 7 ♂♂, coll. 2.v.1937, em. 8.viii.1937 (*R. L. E. Ford*); Ullswater, Cumberland, England, 4 ♀♀, 2 ♂♂, coll. 15.vi.1937, em. 4.vii.1937 (*D. S. Wilkinson*).

Type deposited in the British Museum.

Host. All the material from which I have described this species was bred from the Tineid, *Coleophora fuscidinella* Zell., either on elm, as in the case of the specimens from Cambridge, which includes all Dr. Salt's material, and from Bexley, or on alder.

Cocoons. The parasite pupates inside the case of its host.

This interesting species runs in Marshall's key (1888) to couplet 16 in the second section, and thence, by couplet 18, to couplet 29; but it will not agree with Marshall's description either of *sodalis* Hal., or, alternatively, in the succeeding couplet, of *albipennis* and *impurus* of Nees. As far as the American species are concerned, *coleophorae* will agree with none of the many that are represented in the British Museum; and in Muesebeck's key (1920) it runs to couplet 48, but it is not referable to *lacteicolor* and its costulae are strongly in evidence. In my own key (1932, *Trans. ent. Soc. Lond.* **80**, and as subsequently emended) this new species of mine runs easily to couplet 181 and 184, which should be altered as follows:—

181. Second tergite rugose . . . . . 182.
Second tergite not rugose . . . . . 183.

184. Female with apical breadth of 1st tergite hardly greater than median length of 2nd (12 : 11); S. Africa . . . . . **transvaalensis* Cam.
Female with apical breadth of 1st tergite considerably greater than median length of 2nd . . . . . 184a.

184a. Hypopygium more or less broadly membranous throughout median line, and its apex membranously acute; British Isles *coleophorae* Wilkn.
Hypopygium not membranous along median line, its apex acute but not membranously so; Africa . . . . . *aethiopicus* Wilkn.